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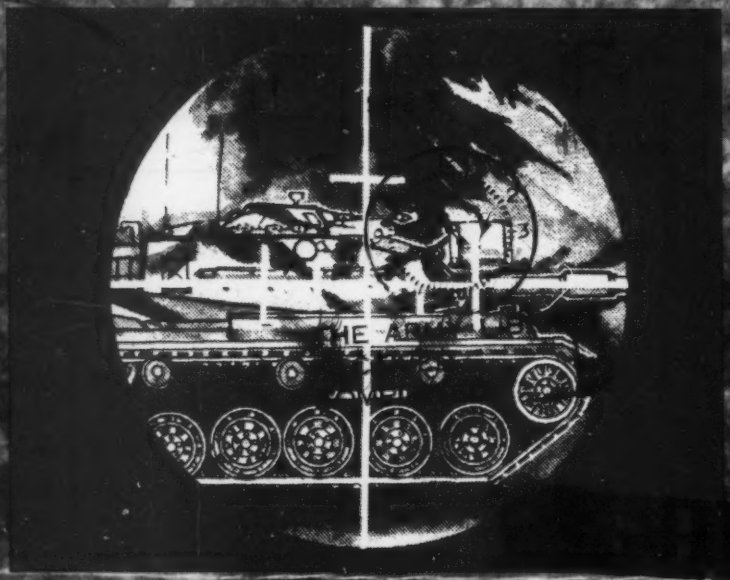
April-June 1982



Tactical Intelligence

United States Army Intelligence Center and School

Military Intelligence

Features

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From the Commander

Interview with the USAICS Commander

BG Richard W. Wilmot was interviewed by 1st Lt. Katherine L. Dooley, Editor, MI Magazine.

QUESTION: The Military Intelligence Branch was formally organized 20 years ago. What strides do you feel the Branch has made since that time?

ANSWER: The Branch has matured in many ways, and yet, it faces a future full of changes and challenges. The Branch is now replete with quality people in both the officer and enlisted ranks. We now have military intelligence expertise in quantity. With regard to units, we have made great strides at the tactical level with our CEWI organizations, and at the strategic level with the developing Echelon Above Corps INSCOM units. While the CEWI elements are imperfect due to shortages of equipment and personnel, they are fielded and are gaining in professionalism each day. We see equipment coming from a variety of sources that will assist the intelligence officer in his support to the commander. Doctrine is evolving, and doctrinal answers will be found in our soon-to-be published FM 34-1 (IEW Operations). Training is improving and soldiers being recruited in 1982 are of a higher quality than in recent years. All the signs are there that indicate we are gaining in health and the trend will continue.

QUESTION: According to your last column in the MI Magazine, you said, "USAICS is 'gearing up' to become the premier school in TRADOC." How do you propose to accomplish that goal?

ANSWER: First of all, we need more top quality people to supplement those we already have at the Intelligence School here, Fort Devens, and the Pensacola and Goodfellow Detachments. Professionalization of the Branch must begin at the institution. Quality at the school will produce quality products, doctrine, combat development concepts, and trained soldiers. We will then be the number one school in TRADOC.

QUESTION: What are the top priorities for USAICS?

ANSWER: A complete mobilization plan and the ability to activate the School to support a war effort is top priority. Other priorities include:

Concentrating all officer training at Fort Huachuca, which requires moving the 37 series courses from Fort Devens;

Improving our Basic Officer Course by giving it a combat arms and tactical intelligence flavor, thus graduating a second lieutenant who is trained in all-source intelligence and capable of serving as a battalion or brigade S2 or assistant S2;

Developing a strategic debriefer/interrogation course for all services;

Obtaining executive agent training responsibility at Fort Devens for the manual Morse course.

(Continued on page 43)

Feedback

Belgians reply

Editor:

Reading the "Military Intelligence" July-September 1981, I was rather surprised to find some really negative and erroneous information about the Belgian Forces in the article "NATO Interoperability at the Tactical Unit Level" written by Captain Edward J. Menard.

As Chief of Staff of the Belgian Forces, I would like to answer three statements of the author in the paragraph "Operation Blue Fox—working with the Belgians."

1. The first paragraph mentions:

". . . previous unsuccessful colonial interventions have taken their toll on Belgium's combat readiness." As shown below by the summary of the real facts, it can hardly be accepted to characterize those operations as "unsuccessful."

INTERVENTIONS IN AFRICA—SUMMARY OF FACTS

Before the independence of Congo (30 June 1960), the Belgians established in the country a military force named "Force Publique" that was composed of Congolese soldiers commanded by Belgian Officers. During both world wars, the "Force Publique" was aside the Allied and took part successfully in several battles in Africa.
Since 1954, a Belgian Airborne Battalion (the so called para-commando's) and an Airborne Training Center were permanently stationed in Congo for training purposes.
In 1959, after some anti-colonial incidents, the presence of Belgian para-commando's in Congo increased up to three battalions, including one reserve battalion.
In 1960, during the period of difficulties that accompanied the independence, several metropolitan volunteer units were sent to Congo to protect the foreign residents. In the same year already those volunteer troops were brought back to Belgium after successful completion of their mission. Some para-commando units remained up to 1962 and technical assistance personnel is still on the spot.
In 1964, the operation "RED DRAGON-BLACK DRAGON" was executed from 20 November to 1 December. Mission: to rescue and evacuate hostages held by rebels. The forces involved were units of the para-commando Regiment under the command of Col. Laurent and fourteen USAF C-130s under command of (U.S.) Col. Gradwell.
The Paratroopers were dropped at Stanleyville on the 24th of November and at Paulis on the 26th. 2500 hostages, among which several U.S. residents, were liberated and evacuated. Own casualties: three.
This operation was very successful and both commanders were decorated by His Majesty the King Baudouin.
Another operation ("RED BEANS") took place from 17 to 22 May 1978 at Kolwezi with a similar mission. The forces were the Para-Commando Regiment (-) commanded by Col. Depoorter and twelve Belgian C-130 under the command of Col. Blume.
The assault was given on 19 May and resulted in the liberation and evacuation of 1000 hostages among which were more U.S. residents. The operation ended without own casualties and one battalion remained in the area til 10 July 1978 to protect the residents in the Shaba province.

2. Although the author refers several times to the "Exercise Blue Fox Final After Action Report" (Mannheim FRG, 6 October 1977), Ref. Nr 26, I am not quite sure that his document is the same as the one I possess. The publication of larger parts of the official Final After Action Report would give the readers a better overall view of the good cooperation between U.S. and Belgian headquarters and units throughout the Blue Fox exercise.

3. I just mentioned some doubt about the "interpretation" of the Final Report. I do also have some doubts about the nations the author speaks of. . . Right in the middle of page 22, the article says: "It requires a lot of diplomacy to deal with an armed force comprised of two peoples who are essentially at civil war."

All military personnel have been taught that military intelligence requires an objective quotation of the sources of information. I suspect

(Continued on page 54)

THE S-2 IN "AIRBORNE ANTI-ARMOR DEFENSE"

by Capt. Paul Grayson Wolfe

Early on Sunday morning the 82d Airborne Division alerted the 1st Brigade Task Force for operational deployment. The entire force mustered rapidly and went into isolation for planning, briefing and rehearsal. The Division Staff briefed the task force commander to the rapid deployment mission they faced. The mission was "to conduct an Airborne Anti-armor Defense in section."

This light infantry task force must defend against an armor heavy force. The concept of anti-armor defense being employed by the 82d Airborne Division is a variation of the Archipelago Defense designated the Airborne Anti-armor Defense. The AAAD is a series of mutually supporting, armor-proof islands of resistance. This basic concept of an attrition defense employs anti-armor weapon systems laterally and in depth throughout the battle area, firing into designated armor kill zones and protected by infantry forces. All anti-armor systems, ATGMs, attack helicopters, Sheridans, LAWs and mines are employed in a coordinated array to attrite the enemy as he passes through the defensive sector.

Intelligence plays a critical role in the AAAD mission. Many of the unique AAAD planning considerations are the S-2's responsibility. By describing his responsibilities and actions the important role of the task force intelligence officer is clearly evident. As with other engagements, the AAAD divides itself into four distinct phases—preparation before the battle; actions in the security/covering force area; actions during contact; and consolidation/reorganization.

PREPARATION BEFORE THE BATTLE

Acknowledging the mission the S-2 began his analysis of the enemy, weather and terrain. The Intelligence Preparation of the Battlefield Process and threat templates proved to be valuable tools. The IPB was a logical framework for the analysis effort and the templates provided a starting point, based on doctrine, that oriented the S-2 to the enemy he faced. The other intelligence subject areas were not analyzed. Once completed, the enemy organization, doctrine and courses of action were adjusted based on the weather and terrain. The intelligence staff then produced a final template that considered all necessary factors.

The weather was studied with special emphasis on visibility. The S-2 determined that the anti-armor weapon systems would have problems because of forecasted ground fog and a low percent of night illumination. During these periods of reduced visibility the reconnaissance and surveillance assets, in particular ground surveillance radars and night observation devices, became even more critical. As a general rule "poor" weather, (i.e., rain, fog, and cold) favors the offense whereas "good" weather with unrestricted observation and moderate temperatures favors the defense.

Terrain analysis and assessment was the key element in the AAAD planning process. The terrain on which the defense was established was a force multiplier. The positioning of friendly forces and the location of armor kill zones were determined by the terrain. The study of the terrain did not rely on map, photo, and engineer analysis alone. The predeployment terrain assessment/analysis was reviewed on the ground.

As the vanguard task force for this mission, division assistance became readily available for the terrain analysis effort. The S-2 routinely requested the division terrain analysis and CEWI support teams. The teams assisted the Battlefield Intelligence Collection Center and provided detailed terrain studies based on maps, imagery and engineer data.

The area of operation was analyzed for 360 degree mobility corridors, avenues of approach, slow-go and no-go terrain, cross-country mobility, choke points and anti-armor kill zones. Mobility corridors were determined because of the limited mobility of the light infantry task force and significant capability of the enemy armor force. The AKZs were pivotal ambush sites. Anti-armor firing positions and protecting infantry positions were designated based on the AKZs.

The S-2 referred back to the doctrinal templates and based on the completed weather and terrain analysis determined conclusions and recommendations. An adjusted template that graphically displays the finalized intelligence analysis resulted. Projected enemy time constraints were included.

The S-2 now turned his attention to the reconnaissance and surveillance plan. The plan reflected four principles.

1. Surveillance coverage as far forward as possible.
2. Surveillance assets that increase and overlap as the

enemy approaches the AAAD.
3. Early reconnaissance and surveillance asset deployment.
4. On the ground adjustment. Poor communications or some other mishap could have broken the coverage of one or more reconnaissance and surveillance asset. Reconnaissance and surveillance redundancy also insured that incoming information could be cross-checked. Terrain weather or asset capability often dictated on the ground adjustments to the reconnaissance and surveillance plan.

Every possible reconnaissance and surveillance asset was considered and requested. These assets included:
1. Air Force interdiction missions
2. Aerial scouts (OH-58s)
3. Aero-rifle platoon
4. Ground surveillance radars
5. Night observation devices
6. Observation/listening posts
7. Patrols
8. SALUTE reports
9. Scout platoons
10. Remote sensors
11. SIGINT assets; direction finding and intercept
12. Unconventional warfare forces
13. Requests for information to higher headquarters/national systems

Not all of the requested assets were received for the 1st Brigade's mission, however, there was an essential planning utility for the S-2 to think in possible as well as probable contingencies. Requests for information that could not be answered by the brigade's reconnaissance and surveillance assets were passed to the Rapid Deployment Joint Task Force Headquarters.

The S-2 was ready to brief the commander. Conclusions were stressed under each intelligence subject area; enemy, weather and terrain. The finalized template graphically capsulized the highlights for the commander. For this operation the weather favored the defense except for early morning ground fog and low night illumination. The S-2 made terrain recommendations. The best areas for the engineer obstacle effort were described.

Specific anti-tank obstacles, anti-armor firing positions and AKZs were identified and emphasized as the priority terrain considerations. He emphasized that the armor must be channelized into the AKZ ambushes by the anti-armor obstacles.

The reconnaissance and surveillance plan was briefed next. The reconnaissance and surveillance asset deployment surveillance coverage was described. It was evident to the commander that the plan had considered various enemy options and would result in early, timely and continuous information.

The S-2 recommended subunit missions that fulfilled intelligence requirements. The commander decided, based on these recommendations, that the scouts would confirm critical terrain locations as well as enemy reconnaissance. Also all units would verify the initial terrain analysis once on the ground by reporting to the TOC using the OCOKA format. The commander and S-2 reviewed the terrain assessment after arrival in the objective area.

Intelligence input was also provided to the task force cover and deception play. A psychological operations loud speaker team was tasked with playing various recordings of weapons firing in the security zone. Camouflage and concealment would be stressed at the individual soldier level and checked by the entire chain of command. This effort would help deceive the enemy as to the actual location of the main battle area.

Much of the predeployment on the ground information was supplied by the Joint Unconventional Warfare Task Force. Unconventional warfare forces had been deployed in the area of operation four weeks earlier. They filled a critical intelligence and continuity gap with detailed reports of enemy action, advance and intention. The task force was continually fed these reports through to insertion in the AO.

ACTIONS IN THE SECURITY/COVERING FORCE AREA

The task force reconnaissance and surveillance coverage began with requests to the United States Air Force tactical air control party for information gained during forward F-4 interdiction strikes. United States Air Force aircraft were a forward asset that was capable of reporting back to the AAAD. As part of the interdiction mission, specific point reconnaissance were requested along their flight routes and enemy avenues of approach. The primary effort was to locate the forward enemy elements. The F-4s, flying interdiction, passed information to the tactical operation's center through the various TACPs located with the task force and infantry maneuver battalions.

Two F-4s returning to rear bases were the first to report enemy armor columns 90 kilometers forward of the AAAD and closing. The BICC section prepared an INTSUM warning of an expected armor division attack.

The Mohawk served as the next reconnaissance and surveillance coverage and provided redundancy and overlap. Survivability was a consideration for both the Mohawk and Aerial Scouts (OH-58s). OH-58s performed specific point reconnaissance based on probable enemy locations.

The ground scout platoons deployed well forward in the security zone covering the major avenues of approach. They were left in dismounted hide positions with PPS-15 radars. The manportable PPS-15s gave the scouts additional surveillance capability out to 3000 meters. The scouts stayed in place and reported contact with enemy reconnaissance, main body and second echelon forces.

The PPS-5 radars, with a range of 10,000 meters were attached to the forward AKZ commanders. The radars reported directly to the commander and the information was then relayed to the TOCs. In this way information was put in the hands of the commanders immediately, and unnecessary communication was avoided. In the event of communication breakdown, the forward units continued to have a significant surveillance capability.

Unit OP/LSs and SALUTE reports formed the backbone of the reconnaissance and surveillance plan. These reports became crucial throughout the covering force and main battle. As each AKZ was initiated and enemy forces were both attrited and also pushed through, the SALUTE reports keyed the next AKZ as to enemy size disposition and the expected direction of attack.

Tactical SIGINT interfaced with the Electronic Warfare elements and determined the most lucrative targets for the jamming efforts. EW timing and asset allocation were determined with SIGINT input.

The reconnaissance and surveillance asset deployment was coordinated with the fire support office. The FSO monitored the locations of all the reconnaissance and surveillance assets so they would not be targeted. The S-2 and FSO coordinated continuously so that targets were interdicted throughout the battle.

ACTIONS DURING CONTACT

Poor night illumination and early morning ground fog initially inhibited visual surveillance. The scouts and radars continued to report critical combat information. The engineer's anti-armor obstacles had temporarily halted enemy reconnaissance, lead elements and main body. The artillery's smoke missions, the PSYOPS effort and EW confused the enemy at critical points in the forward security zone. The enemy became disoriented stationary targets and were forced to deploy because of United States Air Forces artillery and rotary wing gunship fires. The enemy, attempting to meet

their doctrinal objectives, moved to paths of least resistance which channelized them into the waiting AKZs.

As the battle drew closer the commander's ability to influence the action had become limited. Last minute repositioning of forces and reallocation of combat power in the AAAD was unlikely because of time and command and control constraints. The commander relied on decentralized—execution that was based on detailed, centralized planning. The individual AKZ commander's paramount need was timely, accurate and continuous information. This information and lack of command flexibility made the intelligence officer's role pivotal. He directed TOC operations so that the incoming information was analyzed and disseminated to the AKZs and higher headquarters and passed for targeting. The S-2 adjusted and directed the reconnaissance and surveillance assets based on the developing situation. Enemy information was passed over intelligence and, if necessary, command nets. Redundant communications were of utmost importance. Landline linked each unit, AKZ and element with the TOCs. The BICC section simultaneously filtered, analyzed and disseminated INTSUMs.

As each AKZ was initiated, information was continually passed to subsequent AKZs. This information had come from SALUTE reports submitted by the units, scouts, GSRs and the United States Air Force through the TACP link.

The various reconnaissance and surveillance assets as a system had successfully monitored enemy locations throughout the battle.

CONSOLIDATION/ REORGANIZATION

The calm that was never expected during the battle allowed the commander time to assess the results. The battle had left the task force with less than a 30 percent operational strength. They had accomplished their AAAD mission. Two first echelon armor regiments had been attrited and were incapable of further combat.

The commander now had to choose between escape and evasion, breakdown of the remaining force into squad size armor-killer teams or attack of the first/second echelon's soft targets. He turned to the S-2 for information and opinion.

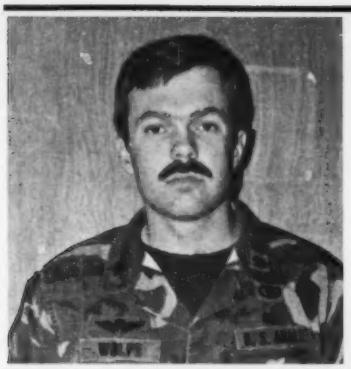
Few of the original reconnaissance and surveillance assets remained under the brigade's control. They had been reassigned to follow-on forces who were fighting the second echelon battle. The S-2 had to rely on training and experience. Several locations had been identified by RDJTF as likely enemy logistics's areas. The S-2 realized that destruction of the enemy's resupply would be crucial.

Advantages and disadvantages were presented to the commander for each course of action. The intelligence officer recommended that squad and platoon size elements conduct hit and run ambushes against the enemy's soft targets. The commander decided that both identified logistic's targets and targets of opportunity would be attacked.

The S-2s actions in preparation for this follow-on mission would be even more critical for the reorganized force that remained. The preparation once again began with the analysis of the enemy, weather and terrain.

CONCLUSIONS

As described, the S-2 must be deeply involved in the planning for the AAAD. Enemy, weather and terrain analysis must be geared to the—specific needs of the AAAD. The intelligence officer must be the commander's terrain expert. The S-2 becomes pivotal as the battle draws near. He must coordinate all information and orchestrate the reconnaissance and surveillance assets so that the commanders know the composition/disposition of the force opposing them and when/where they will face that force. During the battle the S-2s opinion, based on his experience and training, may be critical. The AAAD must be understood by intelligence officers as a possible light infantry tactic or even a probable mission under the Rapid Deployment Force concept.



Capt. Paul Grayson Wolfe is the S-2 of the 1st Bde, 82nd Airborne Division. Previous assignments include S-2 of the 1/504th Infantry, 82nd Airborne Division, A-Team Medic, A-504/5th Mobile Strike Force, 5th Special Forces Group (RVN); Infantry Platoon leader, 3/6th Infantry, Berlin Brigade; and Company Commander, Field Station Berlin. Wolfe received a BA from the University of Illinois and an MA from Boston University in International Relations.

SCAVENGER

Scavenger I was an appropriate name for the field training exercise conducted by the Signal Security Section of the Counter-intelligence Detachment, 209th Military Intelligence Battalion, held recently near Camp Casey.

According to an exercise controller, the reason for calling the exercise 'Scavenger I' was because most of the equipment used in the field was borrowed.

The section, which accomplishes its duties from the office, was unequipped for extensive field training. Everything from lensmatic compasses to GP medium tents were borrowed for the exercise that was held to support the 2d Aviation Battalion, 2d Infantry Division. The major concern was to monitor the aviators communications to make sure they operated according to published directives.

Other reasons for the exercise were to provide common soldier skills training and to provide field training. All the training was conducted under a realistic wartime environment, and soldiers lived in a hostile environment where 'enemy' action was constant. There were 14 separate attacks conducted by the aggressor forces, who were dressed in opposing forces uniforms, during the 10-day long exercise.

The soldiers did their job and at the same time defended themselves against aggressors, so essentially they had two jobs to perform.

Some of the common skills training was incorporated into their reaction to enemy activity. First aid and Geneva Convention rules were tested in aggressor action at one of the monitoring sites. An M-880 vehicle pulled up at the site with three aggressors with plastic AK-47 weapons hiding in the bed. A white phosphorous flare was popped, and the aggressors were shot, who were already dressed in wound simulation kits. Part of the Geneva Convention required treatment for prisoners of war; a good application of what had been taught. (They had gone through 20 hours of first aid training at the Yongsan Education Center prior to deployment.)

A variety of tasks and scenarios tested the signal security personnel's ability to do their job under enemy threat. They ranged from camouflaging their monitoring sites, to leadership reaction training, to taking an enemy held bunker on a hill. Artillery simulators were used during the firefight.

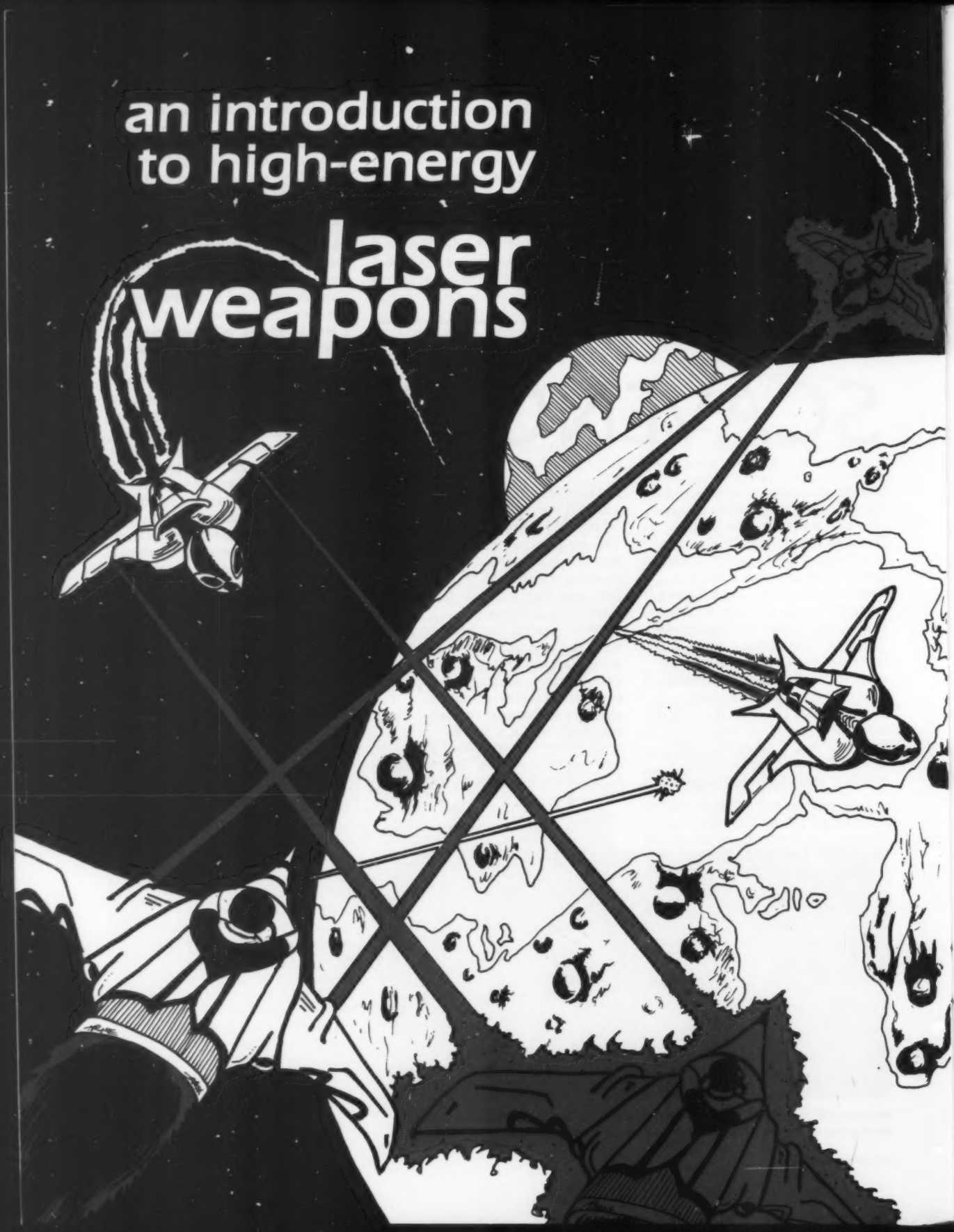
After suffering casualties, the Signal Security Section took the bunker by blowing it up with a Light Anti-tank Weapon. Their responses were great, especially considering they weren't infantry.

In the end, however, the signal security personnel were captured. With a little bit of simulation they were told they were surrounded by an enemy battalion, stripped of all weapons, segregated by rank and marched down the hill to end the exercise.

Nevertheless, "Scavenger II" is being planned for this summer, and, with additional training, maybe the 13 members of the Signal Security Section can take on a whole battalion.

Members of the Signal Security Section move out on reconnaissance patrol during the exercise. (U.S. Army photo by Capt. Nola Jurich)

an introduction to high-energy laser weapons



by 2LT Robert P. Taylor

Introduction

As partially indicated by the recent upsurge in press reports on the topic,[1] the major NATO and Warsaw Pact countries today are competing in a heated R&D race to field effective high-energy laser weapons systems. Virtually all experts agree that the results of this race is of extensive strategic and tactical importance.

Low-energy lasers have been used successfully in medicine and industry for a number of years, but high-energy lasers are relatively new. The following is a general primer on the military uses of HELs. This article was developed for the professional soldier who has limited knowledge in electro-optics, yet whose vocation is critically dependent on developments in this rapidly-evolving field.

Definitions

"LASER" stands for Light Amplification by Stimulated Emission of Radiation. A laser is a device that uses the natural oscillations of atoms or molecules between energy levels of generating coherent electromagnetic radiation in the ultraviolet, visible, or infrared regions of the spectrum.

Electro-optics refers to the broad field of science dealing with the use of electromagnetic waves in the optical frequency spectrum which, when expressed quantitatively, covers the range from $3x10^5$ to $3x10^{10}$ megahertz.

Brief Military History of Electro-Optics

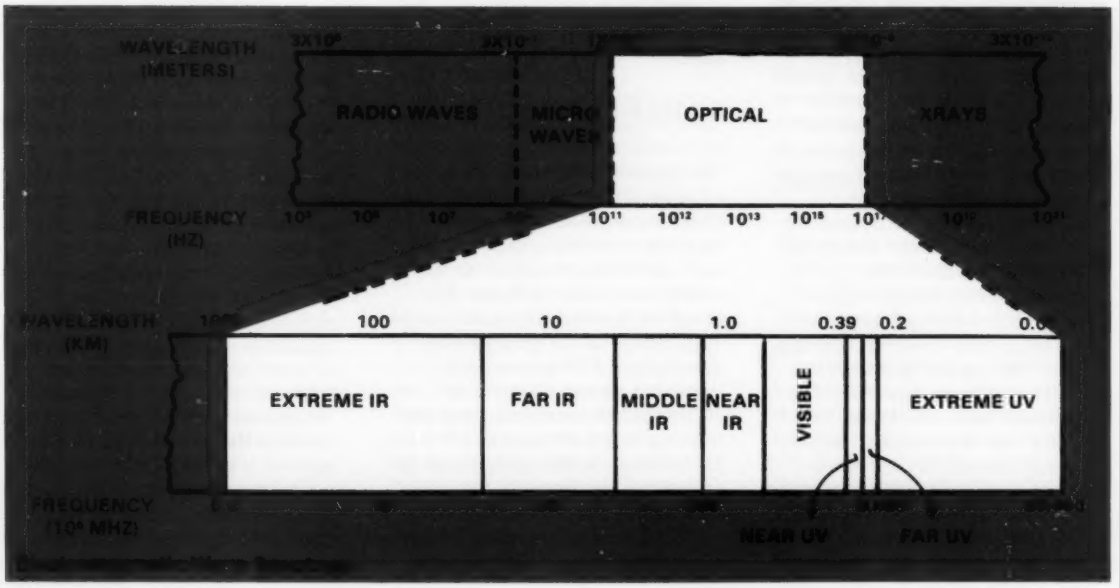
Prior to the 20th Century, military uses of the optical frequency portion of the electromagnetic spectrum were limited to visible frequencies, e.g., to provide early-warning, range and identification data through the human eye and such simple optical devices as the telescope. It has been only in about the last 40 years, with the advances in E-O and the exploitation of optical frequencies outside the visible frequency, that the tremendous potential for military applications of E-O has become apparent.

During World War II, the United States and Great Britain developed and deployed the first IR "snooper scopes" and IR communications systems. Shortly thereafter, the Allies became more interested in the development of radar, causing IR development to lag far behind. It was the Nazis, however, attacking the IR problem with a more aggressive R&D program, who produced the first IR homing missile **(the Wasserfall),** IR headlamps for night driving, and IR communications system **(the Lichtsprecher).**

Today, under the direction of the defense departments of most major countries, E-O technology has moved out of traditional photographic enclaves into such diverse areas as LEL target illumination, weapons guidance and fusing, communications, air defense, fire control, reconnaissance and collection, radiation detection, missile warning systems, and—of course—high-energy lasers.

Brief History of HEL Development

The concept of a HEL weapon capable of instantly vaporizing the hardest materials and immobilizing entire armies is certainly not new. In 1898, H.G. Wells' **The War of the Worlds** describes such "death ray" weapons in amazing detail. The



first steps toward the actual realization of such a weapon, however, came with the initial demonstrations of the laser in 1960, when Theodore H. Maiman, of Hughes Research Laboratories, obtained the first laser action in a ruby crystal.

Subsequently, both Soviet and United States researchers did pioneer work in laser development, and in 1964 the Physics Nobel Prize was shared by scientists from both countries. The output power of solid-state ruby and glass lasers increased rapidly from 1960-1962, after their initial demonstration in 1960, but by 1963 it became apparent to military researchers that the pulsed output energy and average output capabilities of these solid-state lasers would fall far short of the minimum requirements for an effective laser weapon system.

Follow-on developments of the solid-state laser resulted in their current successful deployment as range-finders and target-designators for laser-guided munitions.

Excessive heat waste is the main factor preventing the attainment of high powers from solid-state lasers. Since most of these lasers operate at only a few percent efficiency, 90 percent or more of the pump energy is converted into heat which—if allowed to become too great—destroys the components of such laser systems. Thus, one of the main factors limiting the amount of energy that can be generated from a laser system is the rate at which waste head can be removed or dissipated.[2]

In 1964, just when it appeared that the HEL concept was unattainable, two inventions appeared which began to reawaken the waning interest in laser weapons. The first was the use of high-speed gas flow to remove waste energy from the inefficient laser reactions. The second was the demonstration of the IR molecular nitrogen-carbon dioxide (N_2-CO_2) laser, to which the high-speed gas flow concept could be applied. This laser not only demonstrated the ability to rapidly remove waste energy, but it also used the rapidly expanding gas flow to create the excited molecular energy states (population inversion) required for laser action. Subsequent developments led to the current situation in which there are not many viable approaches to constructing laser devices that will produce the average power levels necessary for a near-term tactical applications. These devices include the gas dynamic, direct discharge, and chemical lasers which operate at different wavelengths with either continuous or pulsed wave forms. The major difference between these lasers is the manner in which population inversion is obtained. More will be said later about the HE chemical lasers, which—at present—seem to be most viable for weapons applications due to their relative efficiency and size/weight characteristics.

Introduction to HEL Military Applications

Without further technical description of various HEL operational concepts, we will now consider the following possible tactical and strategic roles that HELs may play in the future. Surface-to-air, surface-to-surface, air-to-air, sea, and space.

Surface-to-Air

The laser has the following unique characteristic which makes it especially effective against valuable, highly-mobile, soft point targets (such as aircraft): zero time of flight. By drastically reducing radar range requirements for precise lead-prediction, ZTF allows HEL weapons to use all-passive IR fire control systems, thereby making them difficult to DF/destroy and largely immune to enemy electronic countermeasures.

HELs can also be used to counter missiles—as a type of anti-missile missile, if you will. Two Hughes wire-guided TOW anti-tank missiles were destroyed in flight by the Navy/TRW deuterium-flouride high energy laser experimental system tests in 1978 at San Juan Capistrano, Calif. While the aim of the experiments was to determine the accuracy, not the lethality, of the Hughes pointer/tracker system, the Navy was able to destroy four out of four TOW missiles . . . In tests to demonstrate the accuracy of holding the beam on the highly dynamic small target.[3]

As to their current limitations, HELs' lack of all-weather capability and their comparatively short range are the major factors relegating HELs to low-altitude air defense roles-which require the production of a large and dispersed number of such systems to be of significant tactical import. Also, for large-scale production of HEL anti-aircraft systems to be practicable, their cost must be reduced to that of current lab models. However, notwithstanding their current weather, range and cost limitations, HELs show real promise in future tactical air defense systems.

Surface-to-Surface

Of their many possible future roles, HEL surface-to-surface ground applications are at once among the most promising and the least understood at this time.

As noted previously, HEL weapons seem best suited for combating valuable, highly-mobile soft point targets, such as aircraft. While tanks and APCs certainly are valuable, mobile point targets, the armor piercing capability of HELs is currently not competitive with present anti-armor weapons systems.

However, while it is considered cost-ineffective to focus HELs against individual soldiers (soft point targets), HELs—in a wide or area mode—show tremendous potential for effectively neutralizing the fighting ability

of groups of soldiers (valuable, soft targets).[4]

Lasers can affect people both physically and psychologically. The physical effects that exposure to laser radiation has on people is caused by absorption of direct or reflected transmission of infrared, visible and/or ultraviolet radiation. The eyes and skin are the most vulnerable organs. The primary effect of lasers on the skin is thermal burns, ranging in severity from mild reddening to charring (depending on how much radiation is absorbed and the manner in which the affected tissue dissipates the heat).

Because of its greater sensitivity to light, the eye is much more vulnerable than the skin to laser-induced injury. Light amplification even from such relatively low-energy lasers as the M60A3 range finder, can damage the eye ranging from a "dazzle" effect with accompanying after-images to permanent blindess.[5]

The effect produced by ocular absorption of near-infrared and levels of proposed HE chemical laser systems. A second use of orbiting HELs is in a satellite focused amplified radiation cuts and causes hemorrhaging on the retina, which is the sensory membrane that lines the "inner" eye and that "receives" the image.

Lasers can also generate acoustic shock waves, harmonic oscillations and resonance interference in people, as apparently happened to the following victim. "When the beam struck my eye, I heard a distinct popping sound caused by a laser-induced explosion at the back of my eyeball. My vision was obscured almost immediately by streams of blood floating in the vitreous humor. It was like viewing the world through a round fishbowl full of glycerol into which a quart of blood and a handful of black pepper had been partially mixed."[6]

If the beam strikes the fovea—the area of central visions and best color perception—it will produce one or more blind spots which destroy some or all of one's central field of vision. In the worst case, the beam can strike the optic nerve, causing total blindness in the affected eye(s). The hazard is greatest if the eye looks directly into the beam, but severe damage can result from reflected radiation as well, as demonstrated in the case of Dr. C. David Decker.[7]

Laser radiation in the ultraviolet portions of the spectrum poses an additional hazard because injury is not immediately perceived at lower energy levels. In much the same way that a sunburn is not painful while the sun is burning the skin, ultraviolet laser radiation causes injury that is only later perceived. Under such circumstances, one could be exposed to such radiation repeatedly over a short period of time without being immediately aware that the eye was being injured.

In addition to the physiological effects, laser-induced injuries (especially in the eyes) may cause accompanying psychological trauma and shock. "The most immediate response after such an accident is horror. As a Vietnam War Veteran, I have seen several terrible scenes of human carnage, but none affected me more than viewing the world through my blood-filled eyeball. In the aftermath of the accident, I went into shock, as is typical in personal injury accidents."[8]

The hazards described above pertain to the unaided eye, and are magnified considerably if the laser beam is viewed through a magnifying optical device such as a pair of binoculars or a TOW tracking sight. For example, an observer using a pair of "7X" binoculars will receive a radiation level 49 times as great as an observer using the unaided eye.[9] Further, the nominal ocular hazard distance of laser radiation is significantly increased with the use of magnifying optics. The minimum safe distance for viewing a laser rangefinder mounted on the M60A3 tank is roughly 10 kilometers for the unaided eye; using "13X" optics, the danger area is extended to about 80 kilometers.[10]

Some high-ranking Chinese officials suspect that the Russians supplied Vietnamese troops with a new laser-like weapon during the 1979 Sino-Vietnamese War. The Chinese think such weapons may have caused puzzling wounds suffered by a number of Chinese soldiers who were taken to a Canton hospital with severe brain damage, eye damage or both . . . Although U.S. sources could not confirm the report, the Chinese apparently believe that the Soviet Union may have been using the Vietnamese to test new Russian weapons in combat.[11]

There was also unconfirmed but persistent reports that the Vietnamese were using poison gas against the PLA and Chinese civilians. About that same time in 1979, reports filtered out of Kampuchea and Laos indicating the use of some sort of sinister "death ray" weapon(s), which the Vietnamese Army was supposedly "testing" for the Soviets.[12]

Were these reports true? While they were probably exaggerated (the Chinese were/are pretty paranoid of Russia), this writer can neither confirm nor deny the above-cited reports. In any event, LELs are a reality; and as great a hazard as they pose to the eye, LELs pale when compared to that of potential HELs employed as surface-to-surface weapons and systems countermeasures.

Air-to-Air

The use of laser-equipped fighters for air-to-air combat was one of the first applications envisioned for HELs. Initially, it appeared that HEL weapons could be installed on fighter aircraft without prohibitive performance penalties. The advantages of such a system would be two-fold: 1) the HEL could provide increased offensive firepower over that of conventional guns or air-to-air missiles, and 2) the HEL could destroy enemy

air-to-air missiles in flight providing an enormous defensive advantage. While HEL weapons have the potential to play a decisive part in air-to-air conflict, it seems unlikely that they will ever become the only air-to-air weapons.

Projections for the size and weight scaling of HEL weapons systems indicate that laser-equipped fighter aircraft are likely to suffer a significant weight/drag performance disadvantage relative to more maneuverable fighter aircraft equipped with conventional armament.

Until lighter HELs are developed, nonlaser-equipped aircraft should be able to stay out of the lethal range of the laser-equipped aircraft while simultaneously engaging it with long-range missiles. At this time, the air-to-air utility of HELs seems to lie primarily in their potential ability to shoot down enemy missiles in mid-flight. The ability to negate the enemy's offensive missile weapon capability would give a tremendous advantage to a laser-equipped aircraft. Thus, the emerging role for air-to-air HEL weapons appears to be more in the area of aircraft defense against threat surface-to-air and air-to-air missiles rather than the offensive tactical aerial combat role originally envisioned.

Sea

An analysis of HEL applications to Navy missions reveals that the HEL has little promise in terms of an offensive weapon designed to destroy ships. Laser energy of the order of 10^{9}-10^{11} joules would be required to sink surface ships, and such energy requirements are beyond the scope of current HEL technology. In addition, the HEL is not a viable candidate for an anti-submarine weapon because of attenuation by sea water. Even at the best wavelength, the blue-green portion of the visible spectrum, the attenuation is so severe that penetration of HEL beams to any useful depth is simply not practical.

There is, however, a potentially important application in terms of shipborne HEL at anti-aircraft and anti-missile weapons. Current and projected technologies in surface-to-surface and air-to-surface anti-ship missiles pose a formidable challenge to Navy surface vessels. Among the programs under consideration is the use of HEL weapons for ship defense. It appears that HELs have promise in countering anti-ship missiles and anti-ship aircraft. They could be used as a backup, short-range defense in large task forces, where they would complement the long-range area defense provided by Navy aircraft. On ships operating independently from a task force, they could be used as the primary antiship-missile defense. In both cases, the laser's potential to rapidly handle a large number of targets makes it particularly attractive as a counter to saturation attacks.

Space

Of all the potential military applications of lasers discussed previously, spaceborne applications seem to be the most ideally suited to the basic nature of HELs. Why?

The attenuating effect of the atmosphere on laser beam propagation is probably the biggest problem inhibiting the development of HEL weapons systems. These effects include molecular absorption, refraction and aerosol attenuation, which result in significant reduction in the energy and focus of the incident laser beam on targets. The use of HELs at high altitudes or in space represents one possible solution to this problem.

The chemical laser appears to be the most appropriate type of HEL for space application, because of its relative efficiency and size/weight considerations. At the present time, the critical technologies required for a space-based laser weapon system lie in the areas of acquisition, pointing and tracking, and beam forming subsystems rather than the laser itself.

There are at least two potential applications for space-based HEL weapon systems. First, such a system could function as an orbiting anti-ballistic missile system. The hardness of Soviet ICBM re-entry vehicles and upper rocket stages is such that laser kills could be made over appreciable areas of these vehicles with the output power levels of proposed HE chemical laser systems. A second use of orbiting HELs is in a satellite defense role. The United States and the Soviet Union are both placing increasing emphasis on the use of satellite systems for such important military functions as communications, surveillance, weather prediction, and sea and air navigation.

In fact, the Soviets have developed and demonstrated a non-nuclear "hunter-killer" satellite,[13] the implications of which are simple and profound. America's early-warning satellites are in orbit to detect Soviet ICBMs at lift-off and allow our strategic forces the time required to launch a retaliatory counterstrike. If the satellites can be blinded from earth for as little as 20 minutes, then a massive ICBM strike could possibly go undetected until it was too late to launch an effective counterstrike. Such a potential would effectively negate the retaliatory cornerstone of our defense policy and render the U.S. vulnerable to a preemptive nuclear attack.

The vulnerability of critical satellites to attack is a key consideration in the strategic balance of power. Except for a limited nuclear capability (which is being phased out), the only current possible U.S. counterpart to the Soviet's hunter-killer satellites is the Space Shuttle Program.[14]

A space-based laser weapons system has the potential to adequately defend critical satellites against the hunter-killer satellite threat. Since space may be the deciding area in

future war, the space-borne HEL systems promise to be of increasing strategic import.

Conclusion

This article is a general primer on the military uses of high-energy lasers. There are now many viable approaches to constructing laser devices capable of producing the average power levels necessary for near-term tactical application, with the chemical laser being perhaps the most viable. Based on the results of recent and continuing R&D efforts, we can expect that laser pulses of sufficiently high energy will continue to be produced, and incorporated into various HEL weapon systems. To what extent the major NATO and Warsaw Pact countries are able to successfully deploy such weapons is of crucial strategic and tactical importance. Professional soldiers in virtually all the military branches would do well to stay abreast of developments in this rapidly evolving field.

FOOTNOTES

1. For example, ***Aviation Week and Space Technology*** has dedicated more than 100 pages to laser technology in the last 18 months.
2. In a solid-state system, heat diffuses slowly out toward the walls of the laser. If too much heat is generated by pumping too hard, the crystal (usually glass rod) has a tendency to crack. In a gas system, the excess heat causes increased molecular motion which prematurely deexcites the molecules. Heat will also change the index of refraction of the gas causing loss of optical quality, as well as causing chemical breakdown of certain molecules and erosion of the walls. In liquids, heat causes degradation of the dyes and turbulence. In semiconductors, excess heat can destroy the junction.
3. *"U.S. Nears Laser Weapon Decision,"* ***Aviation Week and Space Technology,*** 4 August 1980, p. 48.
4. I would refer the reader to Capt. Jack B. Keller's thoughtful and well-researched article, *"Lasers on Tomorrow's Battlefield,"* in which he discusses in more detail in effects of lasers on personnel. ***Military Intelligence,*** July-September 1981 (Vol. 7, No. 2), pp. 39-43.
5. *Questions and Answers on Tank Laser Rangefinder Hazards,* U.S. Army Environmental Hygiene Agency, Aberdeen Proving Ground, Md., August 1979, p. 2.
6. *"Accident Victim's View,"* ***Laser Focus,*** August 1977, p. 6.
7. Ibid.
8. Ibid.
9. *American National Standard for Safe Use of Lasers,* American National Standards Institute, New York, N.Y., March 1976, p. 54.
10. LTC Douglass P. Bacon, *"Battlefield Lasers,"* ***Military Review,*** October 1980, p. 37.
11. *"Secret Soviet Weapons?"* ***Newsweek,*** 21 May 1979, p. 23.
12. Harlan W. Jencks, *"China's 'Punitive War' Against Vietnam: A Military Assessment,"* ***Asian Survey,*** Vol. XIX, No. 8, August 1979, p. 808.
13. As indicated by the British Broadcasting Company's widely-aired one hour report, "The Real War in Space"(U).
14. Ibid.

2nd Lt. Robert P. Taylor graduated cum laude with honors in Philosophy from Claremont McKenna College, Calif. and commissioned RA as distinguished Military Graduate in May 1981. A graduate of the Tactical Surveillance Officer Course, he is now attending the Airborne Ranger School. Taylor completed the Infantry Officer Basic Course by correspondence. He will report to the 109th MI Bn/(CEWI) for his initial assignment in July 1982.

Language proficiency and bonuses

As part of the Army's overall effort to improve linguist management, MI linguists in MOS 96C and 98G have been the subject of intense discussion and planning. During the debate, questions regarding bonus payments for language skills have been raised. Among these is a question asked by bonus recipients: How does demonstrated proficiency affect initial bonus eligibility or continued payment eligibility?

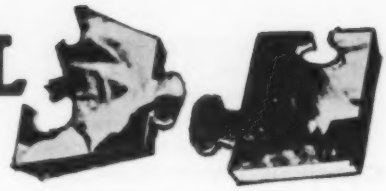
AR 611-6, Army Linguist Program, defines a "Linguist" as anyone who records a level 2 scores in a least one skill area of the Defense Language Proficiency Test (DLPT). This is the minimum standard. While current reenlistment criteria do not stipulate any specific proficiency level as being necessary for eligibility, personnel must be MOS qualified. AR 614-200, Chapter 7, Table 7-1, "Prerequisites to qualify for MOS award and entry into CMF 33, 96 and 98," does not specify a proficiency level for MOS qualification beyond the minimum criteria set forth in AR 611-6. So, the question is, "at what level is the 96C or 98G linguist deemed proficient for reenlistment and thus bonus eligible?" The answer is, at the very least, the minimum qualification level per AR 611-6.

For bonus recipients who have recorded DLPT results of less than the minimum qualification, a new question is raised; namely, "if I'm not qualified in the language for which I receive a bonus, do I now owe Uncle some money?" The answer may be, yes!

AR 611-6 currently states that linguists will DLPT qualify every two years. A programmed revision changes that requirement to EVERY YEAR. Personnel who record substandard or non-qualifying scores are given six months to retest and qualify. Linguists receiving bonuses for a language in which they do not qualify on the second try will be reported to DA MILPERCEN for determination of whether bonus payment should be recouped or whether future payment will be discontinued.

In light of the linguist management initiatives and the apparent movement toward emphasis of language proficiency, 96C and 98G personnel should be reviewing their career orientations, personal efforts to ensure language proficiency, and their current bonus status.

FM 90-2: TACTICAL DECEPTION



By Dr. David Syrett

No one would argue with Sun Tzu's dictum that "All warfare is based on deception." The question is whether ***FM 90-2: Tactical Deception*** (Washington, D.C., 1978) is the proper manual to teach U.S. Army officers commanding corps and lesser units the techniques of tactical deception on the modern battlefield. ***FM90-2: Tactical Deception*** has a number of weaknesses. To begin with, the manual is full of information that is either common sense or belongs in other tactics manuals. Also, many of the schemes or operations proposed are totally impracticable for a corps commander, much less a battalion commander, to carry out successfully owing to the lack of materiel and the proper personnel. Moreover, a number of historical examples used in this manual to illustrate various means of deception are either irrelevant to tactical deception by corps or smaller units, or the schemes have been overtaken by advances in technology.

In Chapter 2, a great weight is placed on the use of tactics which call for feints, demonstrations, ruses or tricks, and displays to mask the real objective and the actual movements towards obtaining that goal. All of this is simple common sense, for any soldier from a private on up will, or should, always attempt to interlace any action or tactical operation with feints, ruses, demonstrations, and the like. After all, the oldest trick in the book is to flush out a sniper by pushing a helmet atop a rifle barrel just over the top of a trench or wall in order draw the sniper's fire.

This manual is correct when it states that "the target is the enemy commander with the authority to make the decision that will achieve our deception objective" and that "the intelligence system plays a unique role in deception." Deception is usually carried out by one intelligence service feeding the pieces of a jigsaw puzzle to an enemy intelligence service in such a way that the enemy thinks that he has been remarkably astute in his ability to understand his opponent's intentions and order of battle. What the enemy does not immediately realize is that the picture formed by the jigsaw puzzle, while

within the range of what is possible and what he thinks is most likely, is in reality totally false.

To be capable of this type of intelligence operation against a knowledgeable enemy requires an intelligence service staffed with officers who not only have incisive and logical minds but also a vast knowledge of the enemy and especially its leadership and intelligence services. Further requirements are that the intelligence service have access to its commanders' intentions and operational plans in order to put into effect a deception scheme, and it also must have almost unlimited resources, much of which is unusual and very often difficult to obtain.

The manual advocates the use of various tricks and schemes, which are difficult for a formation such as an army corps to carry out. The manual suggests, for example, that a "commander may prepare a false document . . . then feign carelessness and allow agents to see the document." What the manual does not mention is the huge effort required to plant documents on an enemy in such a way that they will be believed.

One of the best known instances of planting false documents on an enemy is an operation called *Mincemeat* in which British intelligence used a briefcase containing false papers chained to the body of a dead man to mislead the Germans as to Allied intentions in the Mediterranean during 1943. A number of documents had to be prepared, which, except for their contents, were in all respects genuine. Then a method had to be devised to plant these papers on the Germans in such a way that the enemy would believe their contents. It was decided to find a corpse and make it appear to be

a casualty of an aircraft crash in the Bay of Cadiz. The idea was to have the body with a briefcase chained to it drift ashore near Huelva in Spain, which was a known center of German intelligence activity. Here again there were several problems which had to be overcome. A corpse had to be found, and not just any corpse, such as the victim of an automobile accident, would do. It had to appear to the Germans and the Spanish medical authorities that the man had died from drowning after an aircraft crash.

After obtaining the right type of corpse, the next step was to create a personality that German intelligence would believe. The dead man had to have a credible reason for being on an aircraft enroute to Gibraltar carrying the type of documents that were to be planted on the Germans. This was done by creating a written record of existence from bank accounts to service records for one Major William Martin of the Royal Marines, an expert on landing craft. The next step was to get the newly-created Martin's body into the Gulf of Cadiz at a point where the corpse would drift ashore near Huelva. It was decided that a submarine would be the best method of sending Major Martin on his mission.

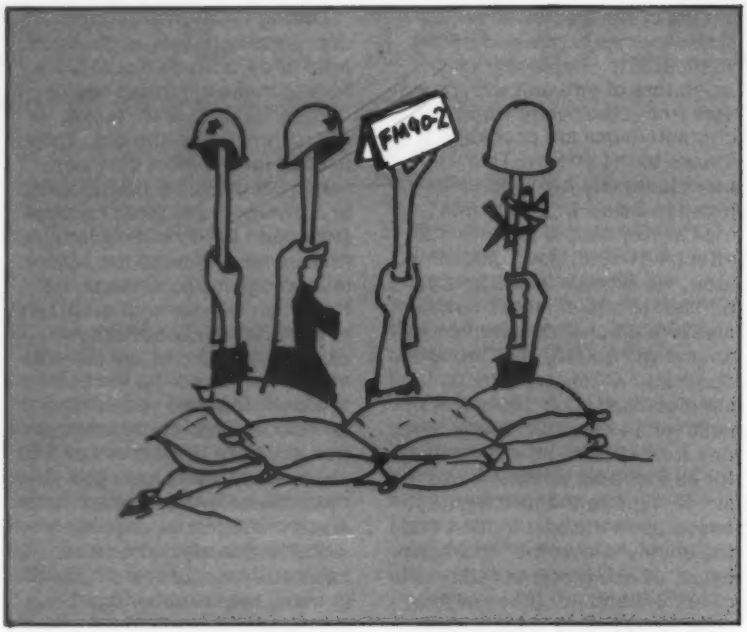
Once Martin's corpse had drifted ashore at Huelva, the air waves were filled with signals inquiring about the whereabouts of Major Martin, and especially his briefcase. At the same time, British consular and diplomatic officials were demanding that the Spanish authorities turn over to them at once the corpse of Martin and his briefcase. The operation ended with Martin being buried with full military honors and Huelva and the British learning from other intelligence sources that the Germans had been deceived by the planted documents. Admittedly, *Mincemeat* was a complex operation, nevertheless it shows that planting false documents on an enemy is a much more difficult problem than having a commander "feign carelessness and allow agents to see [a] document."

One of the electronic deception schemes suggested by the manual is to "Replace [radio] operators of one unit with operators from other units whose characteristics are probably known to the enemy. This will provide the enemy false unit location data." In theory this idea is very simple to carry into effect; however, upon closer look, the scheme is extremely difficult to implement. There is also a good chance that the enemy will quickly see through a deception of this type. In its simplest form, this deception calls for all the radio operators in one formation to be substituted for all the radio operators in a similar type formation. It is based upon the assumption that the enemy knows the "characteristics" of one group of radio operators and not those of the other group. One result of this deception will be that the radio communications of both units will be thrown into varying states of confusion because both groups of radio operators will be working with new commanders and signal officers whose methods of conducting operations will have to be learned. Another problem not foreseen in the manual is that the two units will not only have to exchange radio operators but also radios.

Modern electronic signals analysis consists of more than just how a person works a telegraph key or the use of certain types of message formats, it also analyzes the electronic characteristics of each radio transmitter. No two radio transmitters are electronically exactly alike. Thus, to carry this deception out to its logical conclusion, every radio along with its operator in a unit will have to be exchanged with another unit, if the scheme is to withstand discovery by the enemy. It should be remembered that German radio intelligence, despite the largest and most successful deception operations in the history of warfare, was able to predict which Allied units were to be used in the invasion of Normandy as well as the axis of the forthcoming Allied attack.

During World War II huge deception schemes, such as *Bertram* and *Fortitude South* were able to make extensive use of dummy landing craft, tanks, guns, trucks, and the like. These decoys for the most part were made out of rubber, cardboard, and plywood. ***FM 90-2: Tactical Deception*** barely acknowledges that we have entered the age of technological reconnaissance. No longer will aerial photographs or eyewitness accounts by observers in aircraft be the only means of monitoring the build up or deployment of a military formation. Today a fake formation will have to do far more than deceive aerial photographs. It must have a believable radio net; and it must also be capable of withstanding electronic and infrared analysis, something that in many cases rubber, cardboard, and plywood decoys can no longer do. Not only does a decoy have to look like a tank, it now must also give off heat similar to that of a tank as well as have the same magnetic field as a real tank. ***FM 90-2: Tactical Deception*** suggests that problems of this sort can be overcome by using damaged tanks as decoys, or by using real tanks intermixed with decoys, and that both the real tanks and the decoys be moved around from time to time. It also advocates such tricks as using decoy artillery pieces that are capable of making the same sounds and flashes as real guns and firing them along with actual artillery. Upon reflection, it appears that this type of ruse will very quickly be discovered by any astute intelligence service.

These historical examples on the use of deception enable the reader to have some knowledge of the previous uses of deception; however, with the exception of the evacuation of Pork Chop Hill in 1953, most of the examples are clearly beyond the capability of a corps size formation to carry out. *Bertram* and *Fortitude South,* for example, were enormous and complicated schemes that required the resources of whole World War II



theaters to be put into effect. Some of the historical examples given, such as *Titanic,* which was just one of many interrelated tactical deceptions carried out on or before D-Day, are ripped out of historical context in this manual. In the case of *Fortitude South,* ***FM 90-2: Tactical Deception*** does not even give the operation its full name referring to it only as *Fortitude.* Also, the manual neglects to state that *Fortitude South* was only one part of a huge deception known as *Bodyguard* aimed at the Germans to cover the Normandy landings. Compounding these errors is the fact that this manual does not mention the Allied use of double agents and cryptographic intelligence, which were in large part what made *Fortitude South* possible. It is always difficult to use historical examples as a means of formulating policy, strategy, or tactics; but to use bad or imperfectly explained historical examples can be dangerously misleading.

A good part of the manual is filled with such obvious observations as, "REMEMBER: EVERYTHING THAT MOVES ON THE GROUND MAKES TRACKS." Yet, although the manual abounds with common sense statements about minor tactics, it treats some of the most complex intelligence and deception operations in a totally simplistic manner. This manual passes over the problems and difficulties of planting false documents on an enemy and what is really required to produce a fake military formation and its radio nets in this era of very sophisticated techniques of electronic and infrared analysis. The manual is also filled with many flawed or misunderstood historical examples of both strategic and tactical deceptions. Above all else, the greatest weakness is that while it gives the reader an often misleading and all too quick look at the techniques and craft of battlefield deception, the manual is neither detailed nor complete enough to serve as a guide or set of directions on how a commander should go about using tactical deception on the modern battlefield. Working on the principle that a little knowledge is dangerous, ***FM 90-2: Tactical Deception*** should be withdrawn, redone, and then reissued. If the manual cannot be made more explicit and sophisticated for reasons of security, then it should still be withdrawn, redone, and then issued under some other type of format.

David Syrett was educated at Columbia University and the University of London. He has written **Shipping and the American War** and **The Siege and Capture of Havana, 1762.** Currently Professor Syrett is the John F. Morrison Professor of Military History at the U.S. Army Command and General Staff College while on leave from Queens College of the City University of New York.

USAISD Implements Tactical Training Program

by 1st Lt. Lee E. Taylor

In response to input from tactical intelligence units worldwide, the United States Army Intelligence School—Fort Devens has initiated a tactical training program for the Advanced Individual Training companies of the 1st Battalion.

Using FM 21-2, THE SOLDIER'S MANUAL OF COMMON TASKS, as the major base for training and operations in the field, this new program places each of the four AIT companies in the field every fourth month. This week-long exercise enables the AIT soldier to have at least one exercise "under his belt" prior to arriving at his first intelligence assignment. In addition to the skills outlined in FM 21-2, the program emphasizes day to day life in a tactical field environment.

Bravo Company was chosen as the first test company and spent March 29 through April 1 fully operating under field conditions. The exercise had to be carefully executed to insure there would be no interference with his/her technical training in their respective Military Occupational Specialty instruction. Therefore, logistical support for such items as vehicle transportation and close coordination with the AIT instructional departments was of vital importance to the success of the exercise.

The conduct of the exercise was broken down into six phases: **PHASE I—Preparation for deployment.** B Company personnel received partial TA-50 issue beginning two weeks prior to deployment. Platoon sergeants supervised issue and the proper wear and care of uniform and equipment, while the Commander and Executive Officer conducted classes on safety and prevention of injury and sanitation/hygiene in the field. Additionally, all members of Bravo Company viewed a television tape on Combat Electronic Warfare Intelligence to prepare soldiers for assignments to CEWI units and to show the need for field training.

Cadre began signing for and receiving organizational equipment from tasked support units and all cadre members and instructors cnducted rehearsals and terrain walks at the actual field site. Protective masks and weapons were issued on the evening prior to deployment, as all personnel were alerted and restricted to the company area. **PHASE II—Movement to the Field.** An advance party of cadre and select non-enrolled personnel moved to the field one day prior to deployment, along with post support attachments, including vehicle drivers and medics. Due to the two-shift operation of morning and afternoon technical instruction, the company conducted both an AM and PM four and one-half mile tactical road march from garrison to the field site. En-route, each road march encountered nuclear/biological/chemical attacks, ambushes, sniper fire indirect fire and first aid casualties, as well as chemical and biological casualties as integrated training objectives. Each individual wore full Load Bearing Equipment with protective mask and weapon, while duffle bags containing shelter halves, sleeping bags, air mattresses and uniform items were prepositioned at the training site.

PHASE II—Site Preparation. The advance party began the site preparation for all administrative and training areas which included the set-up of one GP medium and one GP small tent. Additionally, the advance party, under the guidance of 10th MI Company personnel of the 10th Special Forces Group (Airborne), constructed hasty fighting positions, two-man foxholes, machinegun nest and full underground bunkers to serve as examples in the tactical demonstration area.

Upon arrival of each of the road marches the following day, company personnel set up their individual shelter halves and fighting positions. Site and defensive posture improvements were constantly made throughout the exercise.

PHASE IV—Operations. During the exercise all students were transported to and from technical training back at garrison via 2-1/2 ton trucks. While the AM students were in class, PM students and non-enrolled personnel received military stakes training to get both hands-on training and testing in such areas as NBC, first aid, claymore mines, land navigation, tactics and defensive posture. This enabled the student to demonstrate his/her competence in the commnon skills outlined in FM 21-2.

This schedule was reversed in the afternoon as the PM students went to technical training and the AM students began their station training. Additional training was given the entire company

(Continued on page 48)

"HEY, DEUCE, WHAT DOES THIS MEAN?"

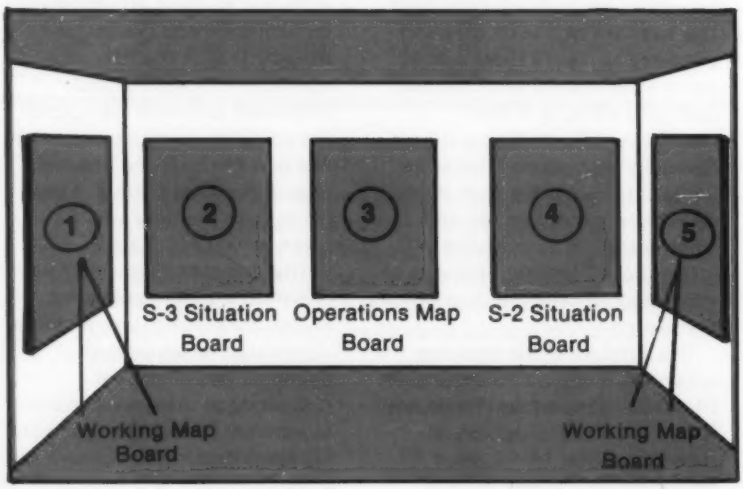
by Maj. S. Dan Johnston

The scene is a tactical operations center for a combat unit deployed on a field exercise in a cold, rainy forest in Europe. The S-3s working area is abuzz with semi-controlled hysteria. A frazzled NCO or captain occasionally breaks from the mob to scan the operations map, make a sweeping mark with a grease pencil, yell for the fire support officer, and re-enter the mayhem. On the other side of the TOC, huddled in poor light and cold (usually because the S-3 section has the TOC's best light set and only space heater), the S-2 labors in quiet semi-seclusion, busily marking up his intelligence situation map with strange symbols. He occasionally ventures to the S-3 operations map to implant an enemy unit symbol and returns unnoticed to his work. The commander enters the TOC, his overshoes are awash in mud, his parka and helmet are dripping wet, his web gear jauntily hanging from his shoulders, and his mouth grimaced around an unlit cigar butt. After a short, pointed conversation on the radio with a delinquent subordinate unit S-3, the commander props himself before the operations map with a paper cup half full of lukewarm coffee. Shortly, the inevitable question is heard: "Hey, Deuce, what does this mean?" The S-2 goes to the map and explains his symbology and how it relates to the current situation. After a couple of routine questions, the S-2 is dismissed and the commander and S-3 huddle to formulate unit plans.

Unfortunately, this scene is repeated too often, in too many units, and too many field exercises. It reflects an unequal, poorly developed relationship between the S-2 and S-3, an inefficient use of the operations map, and the waste of the full talents of a highly trained staff officer, the S-2. Attention to two subject areas can solve the problems reflected by this scene. One, the development of a sound, professional relationship between the S-3, a senior member of the staff, and the S-2 often the junior member of the staff. The other involves techniques of TOC arrangement and operations map utilization, and is the primary topic of this article. While the success of the system discussed here is dependent on the S-2/S-3 relationship and the S-2s sound analytical expertise and knowledge of the enemy, the techniques have created an efficient and harmonious TOC operation.

A key to an effective arrangement of the maps and situation boards used in the TOC are the combined efforts of operations and intelligence personnel to accomplish the best unit plans and orders while simultaneously allowing for independent operation by each of the sections. The TOC arrangement depicted by the five boards allows for all of that. Boards 1 and 5 are the "working" boards for the S-3 and S-2 sections. They may be of any size or description, but should be of the same scale as the operations map. Each section requires a map for independent work and "doodling," the S-3 for future plans, and the S-2 for order of battle and surveillance planning. These map boards may be placed at any location in the TOC convenient to the owning section.

The placement of the remaining three boards is critical. They are interrelated and their positioning in sequence is one area

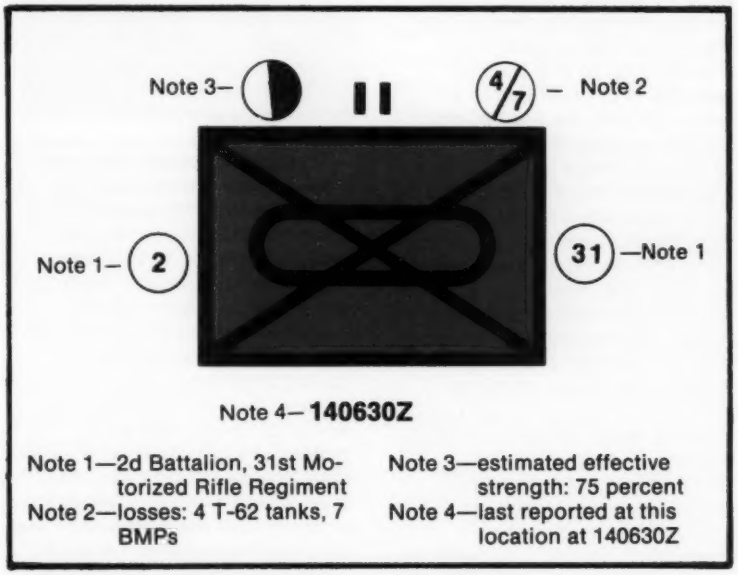


of the TOC in the key to the success of this system. The center board is the operations map and the boards on either side represent the S-3 situation board and S-2 situation board. Significant events can be numerically keyed to the operations map board and the proximity of the two boards makes cross-referencing simple.

Specific techniques for the S-2 information display will be presented in detail shortly. It is in these techniques that the S-2 will be able to convince the S-3 that the intelligence picture can be presented on the operations map in a neat, useful manner that will not "get in his way." After a while, as the S-3 realizes the benefits gained by having a true intelligence/operations map, he might even admit that he likes it. The building blocks for the intelligence picture include water-based felt tip pens, permanent felt tip pens, acetate unit symbols, white and assorted colored adhesive dots (8 mm diameter).

The felt tip acetate marking pens and adhesive dots can be purchased in stationary or military book stores. The acetate unit symbols can be ordered from the local training aids support element. The symbols can be produced by the TASE in any size, color, and for any unit type. The symbols are usually produced in sheets. The most visible and easily reocgnizable enemy-related color for the symbols is orange (the unit symbology is printed in black, only the background color is orange). Unit symbols can be ordered in different sizes for different size units (i.e., decreasing sized symbols from division to platoon). If the symbols are needed immediately, they can be made from acetate sheets or document protectors using permanent felt tip pens. These acetate unit symbols are easy to read and, when double-stick tape is placed on the back, easy to move from place to place on the map. The neatness and absence of grease pencil smears should win the S-3s heart.

The symbols are placed on an acetate overlay rather than the operations map board itself. This allows for other briefings to be made at the operations map without the intelligence overlay present and, simultaneously, permits the posting of the intelligence overlay at the S-2s working map while that briefing is ongoing without wasting the S-2s time waiting for the briefing to end.

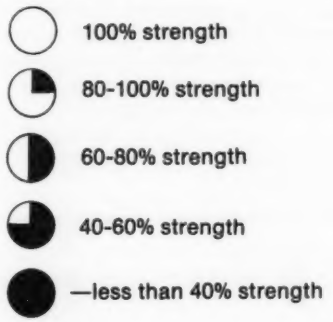


As the blank symbols are cut from their production sheets, a margin of acetate should be left on all four sides to allow for placement of the four small white adhesive dots shown below. These notes explain their purpose:

Note 1. These dots contain enemy unit identification information. As the unit is identified, its designation and its superior unit's designation are entered. The presence of these dots makes it possible to locate at a glance the identified and unidentified enemy units on the situation map.

Note 2. This dot contains cumulative enemy losses of key equipment. For tank units, cumulative tank losses are entered. For motorized rifle units, both tank and APC losses are entered. These notations will simplify computation of the estimated effective strength of that particular unit and the remaining dot will assist in the visual presentation of that strength.

Note 3. This dot is divided into quarters and filled in, by quarter, in a clockwise rotation, as the enemy unit's estimated effective strength diminishes from 100 to 80 to 60 to less than 40 percent. For example.



This visual presentation makes for easy recognition of estimated enemy strengths, even from a distance.

Note 4. The last time that the unit was reported to have been in the posted location is entered in water-based pen and changed each time the location is

changed or updated. Adhesive dots are also used to identify the location, nature, and chronological sequence of significant events on the situation map. Using a color-code and numbered cross-reference system, the significant enemy events can be clearly pictured.

When this system was being developed, adhesive dots in various colors were tried; in almost all cases, the dots became invisible when posted on the intelligence overlay over the typical topographic map. The solution to this visibility problem is to color half of a white dot with the desired color prior to posting. The white half of the dot makes the dot visible and permits numbered entries on the dot, while the colored half signifies the nature of the event for which the posting is made. In practice, it is neater to cut colored adhesive dots in half and place these halves over the white dots for posting. The colors are keyed to the types of enemy activity. For example red—contact, blue—air, green—NBC, brown—engineer, yellow—partisan/insurgent/sabotage, black—artillery, and white—miscellaneous all/others.

As events occur, a dot with the appropriate color is placed at the location of the event and the next sequential event number is placed in the white portion of the dot. The number in the dot refers to the enemy events board posted next to the operations map. Type entries on the significant events board will be as follows:

This "dot method" has a number of advantages. It is a neat, easy method of posting significant events to the operations map; its cross-referencing method leads interested parties to specific information on the event either on the S-2 situation board or in the S-2 journal; its color-coding feature assists in quick pattern analysis, especially in areas of insurgent activity and air, NBC, and artillery attacks; and the color and numbering system act as an aid to impromptu briefings without notes by providing memory assistance in chronological occurrence and pattern analysis.

The use of acetate unit symbols and adhesive dots as described makes the presentation of enemy information quick, easy, and useful. In fact, after the S-3 sees it, he may want to use a similar system for the friendly situation (the TASE can produce unit symbols in all colors: blue for infantry, red for artillery, yellow for armor, red/white for cav). There are a couple of other ideas which will make the working relationship even more efficient. The pegs which mount the overlays on the situation map should be duplicated for each map board in the entire headquarters. Pegs should be at the exact same grid coordinates on the S-2 and S-3 working maps, on the S-1/S-4 map, on the FSO's map, and even on the briefing map boards in garrison. This will facilitate easy transfer of the overlays from board to board. In the placement of holes for these pegs on each overlay produced by the headquarters will give each briefing, no matter on which map board it is presented, a professional appearance and complete flexibility.

For ready access to the operations map, the S-2/S-3 communications assets in the TOC can be remoted to a central location near the consolidated situation map. Granted, this is a controversial issue because of noise control, personnel placement, and information flow, but the consolidated situation map makes centralized communications banks a viable alternative. And finally, highlight with black felt pen the grid lines on the situation map every ten kilometers before the acetate is placed over it. The grids on a situation map become practically unreadable as overlays are added and highlighting grid line numbers or enlarging marginal grid line numbers offer only minimal relief. The black grid lines each ten kilometers really stand out and, in combination with enlarged grid line numbers in the margin, make it possible to read a grid location to six digits from across the room.

These techniques are guaranteed to work. They will help the S-2 manage, display, and analyze intelligence. They will help the S-2 develop credibility as an efficient staff officer. They may even make the S-2 friends with the S-3. Used well, these techniques will change "Deuce" from a dreaded term of ridicule and disdain to one of respect

Blue
141430Z; enemy air attack on B, 1-78 Inf (PB647438); 4 SU-7 acft; 2 dest'd (13)

Yellow
140445Z; sappers destroyed 500 gal of diesel fuel in 1st Bde FAST (PB637216) (17)

Black
140515Z; registration of enemy 130 mm artillery; 3 rounds (PB658436) (20)

Note: The circled numbers at the end of line are the journal numbers for the messages in the S-2s log from which the information was derived. If the reader wants further information on the incident, he knows where he can locate it.

and near affection. Try them; they have worked before; they will work again. Good luck, Deuce!
(NOTE: Credit for assistance in developing these techniques must be granted Capt. Al Passacantando, Infantry, Ft. Polk, La., and 1st Sgt. Ron Dumka, Infantry, Ft. Lewis, Wash.)

Major Johnston is assigned to the 504th MI Group (CEWI) at Fort Hood, Texas. He was commissioned into MI in 1969 from ROTC at Trinity University in San Antonio, Tx. His military schooling includes Basic Infantry Officer, Advanced MI Officer, Ranger, Airborne, Jungle Operations, Aerial Surveillance Officer, and Tactical SIGINT Officer courses. He has served in USAREUR; the Republic of Vietnam; III Corps; S2, 3d Infantry Division and USAICS. He has also been an instructor at USAICS, Ft Huachuca.

SPECIALTY PROPONENCY ADVOCATE

PROPONENCY INFLUENCES E-7 SELECTION BOARD: A milestone in specialty proponency was achieved in December 1981 when the Deputy Chief of Staff for Personnel, Department of Army, requested the Specialty Proponency Office, USAICS, to provide input for the pending E-7 selection board. MI Branch had never been requested to influence the enlisted selection board process. Representatives of the SPOs at USAICS and USAISD reviewed the new systems which could alter authorization levels, analyzed the data provided by DCSPER concerning authorized/projected strengths for all MOSs in CMFs 33, 96, and 98, and made recommendations to the selection board. The SPOs analysis entailed special consideration for those MOSs in overstrength or understrength categories. Results of the selection board published in the Army Times, 31 May 1982, revealed that the Armywide selection rate was 22.9 percent of those eligible (primary and secondary zones) for promotion, while the composite selection rate for the MI CMFs was 41.9 percent (CMF 33-57.9 percent, CMF 96-55.6 percent, CMF 98-30.6 percent). There were many individual MOSs that exceeded the selection rates for CMFs 33 and 96, but no other CMF had an overall selection rate in excess of 50 percent. In addition, since most of our intelligence MOSs are in shortage category, promotions for MI personnel should continue to remain at a high level. The information related above is encouraging because the recommendations provided to the selection board by the SPO USAICS were acknowledged by the board and incorporated into the board's proceedings. These recommendations, resulted in higher selection rates for several MOSs, and precluded the automatic reclassification of personnel in one of our overstrength MOSs (05H). This process of providing input to selection boards will be an ongoing task for the SPO and will ensure that MIs voice will be heard concerning MI personel actions. In May 1982, SPO provided recommendations to the E-9 selection board and will be requested to provide input for the E-8 selection board. Branch proponency is now a reality and we solicit input from all personnel in MI Branch. If you have any suggestions to improve, change, or revise an MOS or SC please forward your suggestions to the appropriate SPO at USAICS or USAISD: Commander, U.S. Army Intelligence Center and School, ATTN: ATSI-TD-SPO, Fort Huachuca, Ariz., 85613 (Autovon 879-3047/3254); Deputy Commandant U.S. Army Intelligence School, Fort Devens, ATTN: ATSI-ETD-SP, Fort Devens, Mass., 01433 (Autovon 256-3411/2179).

the enigma cipher machine

by 2LT Gary M. Bateman

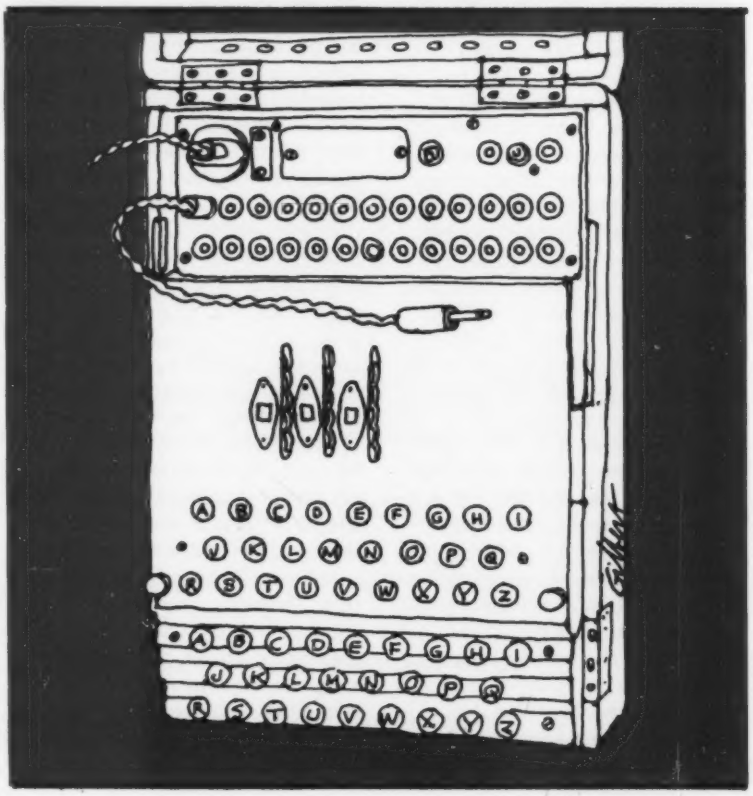
Introduction

This article is not to attempt complete coverage of the Enigma cipher machine and the events surrounding it. Such an effort would be well beyond its scope. Rather, it will be an overview which will briefly highlight and explain Enigma and its subsequent use by the Germans. It will illuminate the valiant efforts of the Allies in solving the German Enigma Codes and demonstrate how the intelligence derived from discovering Enigma's secret contributed to the Allies' war effort. The conclusion will depict Enigma's legacy to modern day cryptology and cryptanalysis. Similarly, the intent of the article is to present a logical and an orderly picture of Enigma, its relationship to World War II, and its historical place in the field of military intelligence.

Enigma was given birth in 1923 by its inventor, Dr. Arthur Scherbius, an engineer, who resided in the Berlin suburb of Wilmersdorf. Scherbius' company in Berlin, called Cipher Machines Corporation, tried unsuccessfully for several years to market its new cryptologic product to interested commercial buyers. Scherbius' original Enigma model was not patented until 1928. By this time Scherbius was dead and his company was floundering, yet the company attempted to create a viable commercial market for Enigma.

Despite initial setbacks for Enigma on the commercial market, in 1926, the German navy showed an interest and developed its own adaptation of the commercial cipher machine. It was called Funkshlussel C[1] literally meaning "radio key"). By 1928, the German army introduced its own version as well: Enigma G[2]. Both Enigma C and Enigma G used three changeable cipher rotors which, because they offered too few permutations in their daily key settings, were considered to be unsecure.[1]

Regarding the G version of Enigma, British Naval Intelligence veteran and author, Patrick Beesly, makes the following observations: *The general principles of this type of machine were fairly widely known and more than one make was on the market in Europe and America. Though a number of improvements were introduced in successive models in the interest of security, the basic machine had a typewriter-like keyboard, was about the size of an office typewriter, was powered by electric batteries*



and contained in a wooden box. The enciphering mechanism consisted of a number of rotatable drums or rotors [in the case of Enigmas C and G: three rotors] about half an inch wide, around the circumference of which were engraved the letters of the alphabet. These rotors were mechanically geared together so that, when one was moved by depressing a typewriter key, the movements of the others were irregular. Electric impulses, passing through the rotors successively and reflected back from the end one through different mazes determined by the relative positions of the rotors, effected the encipherment of each individual letter and the result was indicated by a lamp lighting up the appropriate letter. This cipher key for a particular period, say twenty-four hours, was determined by the starting position of each of the rotors and was of course easily changed. More drastic changes could be introduced by the replacement of one or more rotors.[2]

Since cryptanalysts look for cipher repetition in intercepted message traffic in order to develop clues on how to break a given code or code system, one can certainly appreciate, in historical retrospect, the vast challenges that Enigma posed for cryptanalysts during the twenties, thirties and forties, as the cipher machine developed into a series of different models—each one being distinctly more sophisticated than the other. By 1934, the German army adopted another improved version of Enigma called Enigma I;[3] and likewise the German navy introduced the Enigma M, also known as Funkshlussel M.[4] Enigma I used three cipher rotors at a time out of a possible group of five in order to encrypt message traffic. Enigma M also used three cipher rotors at a time—but selected them from a group of eight, rather than the customary group of five.

On Enigma I each of its three rotors had 26 letters, meaning that the basic number of possible encoding positions equalled 26x26x26 or 17,576.[5] Enigma M, with its five rotor capability, had 26x26x26x26x26 or 11,881,376 possible encoding positions (or different alphabetic variables to go through before the encoder would start to repeat his cipher groups, and therefore, leave his message code open to detection by a skilled enemy cryptanalyst who would be looking for such cipher repetition in daily intercepted traffic).[6] To further complicate matters the German navy by the forties had introduced the M-3 or M-4 versions of the Enigma M which, utilizing four rotors out of a stock of eight, vastly increased the total number of cipher permutations and combinations possible.[7]

Near the outset of World War II, the Germans, in their relentless quest for the ultimate secrecy and security of their military plans and operations (as well as their diplomatic interactions and intentions), believed Enigma to be the answer to their pursuit of the perfect encipherment device. With so many cipher permutations and combinations possible, it appeared, at least initially, that the Germans did indeed possess a foolproof enciphering device. The command and intelligence efforts of Hitler's war machine would be firmly grounded in this seemingly unshakable crypto-security system known as Enigma. As history bears out, Enigma and its code did have weaknesses (after all both were products of the human mind) which, if properly exploited, would yield valuable contributions to the Allies' struggle against the Third Reich.

HOW THE ALLIES BROKE THE GERMAN ENIGMA CODES

The beginning of the effort to break the German Enigma Codes which eventually culminated in Project Ultra at Bletchley Park, England, found its roots in the masterful work of the Polish Intelligence Service. Throughout the twenties and thirties the Poles were acutely aware of what the Germans were doing with Enigma, and they used their cryptanalytic skills to develop what came to be known as "the bomb," a machine composed of six reproductions of German Enigmas, powered by electricity, which worked out daily Enigma settings. Professor Harold C. Deutsch of the U.S. Army War College describes it as . . . ***something of a scientific miracle that in time much transcended Enigma itself. It was at first an electro-mechanical and later an electronic computer that was aimed to adjust itself to whatever alterations the Germans might make in the arrangement of the three (later five) rotors and ten pairs of plugs of the Enigma mechanism. By 1937, its Polish inventors had improved it to a point where, for a time, they read three-fourths of all Enigma messages.***[8]

The collapse of Poland in September 1939 made it imperative that the Poles transfer their knowledge of Enigma to the French and the British. Both Britain and France would each receive from the Poles a copy of a German Enigma, built in Poland, along with design plans for the construction of a "Bomb." The British version of the the Polish Bomb was housed at the center of Allied code breaking operations in Bletchley Park, England. It was here that a rather unusual amalgamation of dedicated American and British scientists, intellectuals, mathematicians, linguists, cryptanalysts, and military intelligence specialists pondered the seemingly endless and daily problems presented by the German Enigma Codes.[9] By 1944, the term ultra became the general code designation for all top secret work done at Bletchley Park having to do with the exploitation of Enigma.

Throughout World War II, although Bletchley Park was the focal point for the decoding of daily Enigma settings, it must be reemphasized that all of this marvelous cryptologic work would have not been possible, if not for the original pioneering

efforts of the Polish cryptanalysts in the twenties and thirties, who, by using mathematics and cryptanalysis managed to solve Enigma's secret. Regarding Enigma and the Polish efforts to discover its secret, Professor Jozef Garlinski in his book **The Enigma War** has observed that *the Germans believed that this cipher system [Enigma], if correctly used, ensured complete security; they did, however, realize that in a war both the machine and its keys could fall into enemy hands. They did not anticipate that the application of new cryptanalytical methods exploiting some of the machine's own characteristics, and weak points of operating instructions as well as mistakes by the cipher clerks, would enable the cipher to be broken using only intercepted transmissions. Polish cryptanalysts made use of all these circumstances relatively early on and solved the Enigma cipher by the end of 1932.*[10]

The original work of the Poles in solving Enigma, along with the collective efforts of the Allies at Bletchley Park made the intelligent exploitation of Enigma data possible. Since we could read the German's secret mail—so to speak—without them suspecting it, we had firsthand knowledge of their intentions and plans. If this ability did not give the allies a decisive advantage over the Axis powers in the successful prosecution of the war, it at least gave them a distinct and competitive cutting edge in their favor.

INTELLIGENCE DERIVED FROM ENIGMA

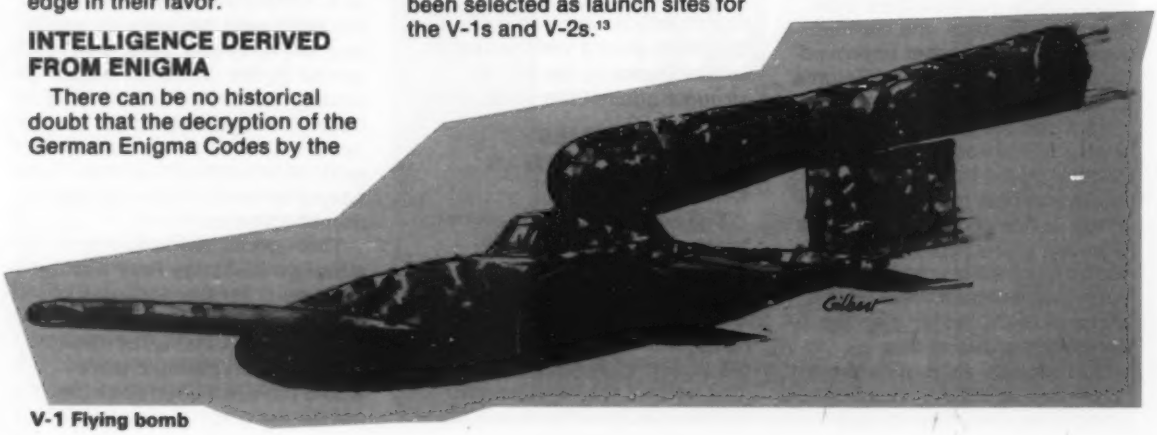
There can be no historical doubt that the decryption of the German Enigma Codes by the Allies aided them in their struggle with Hitler's Germany. Tactical and strategic revelations derived from Enigma contributed to the West's struggle with the Axis in three notable fights-to-the-finish: the Battles of Britain and the Atlantic, as well as the tremendous challenge of evicting Field Marshall Erwin Rommel and his Afrika Korps from North Africa.[11] Similarly, in U-Boat warfare, Enigma-derived intelligence enabled the American and British navies to break the death grip that the German navy held on Allied military and merchant shipping in the Atlantic. By learning the meaning of such principal German naval ciphers as HYDRA, TRITON, TETIS, MEDUSA, AEGIR and NEPTUN, the British and American navies were able to maintain close surveillance on the locations of U-Boat Wolf Packs and German military shipping in general.[12]

Enigma data helped the British to focus clearly on a problem that vexed them dearly during the twilight years of the war, to wit: Hitler's infamous Vergeltungswaffen (retaliation or vengeance weapons), succinctly known in two versions as the V-1 (flying bomb) and V-2 (rocket). Intelligence from Enigma, in addition to aerial photography confirmed for the British that Peenemunde on the Baltic Coast was Germany's major development and testing center for its V-series weapons, and that certain geographical areas in Belgium and France and had been selected as launch sites for the V-1s and V-2s.[13]

Enigma also had a direct relationship to the war effort in the Pacific. Japan had purchased German Enigma machines before the war and adapted them for its own intelligence and communications uses. Japan's so-called Purple cipher machine was nothing more than a variation of the German Enigma (via Bletchley Park) which played a significant role in breaking the Japanese Code. It was also to the Allies' benefit that the Japanese were not the best cryptanalysts in the world, and that America fortunately had its greatest cryptologist, William Friedman, diligently working to master the Japanese Purple cipher.[14]

Enigma-deciphered messages aided the Allies in their D-day invasion effort. Regarding the Normandy operation, Professor Harold C. Deutsch of the U.S. Army War College writes: *There is much that offers high drama in the tale of how the Allies listened in on high-level German debates on where the landing should be expected; how the Allies, through a rich variety of devices, nurtured those illusions which were most serviceable to them; and how, in the end, they achieved complete tactical surprise.*[15]

By reading the German Armed Forces Intelligence Communications via Enigma, the Western powers were able to accurately gauge Hitler's intentions and plans, and to exploit his numer-



V-1 Flying bomb

ous mistakes as well. Enigma was the security blanket of German military intelligence—it was also its Achilles' heel.

Enigma-derived intelligence under the guise of ultra was, however, misused on certain occasions by Allied military leaders. Sometimes it was not heeded at all. Proper utilization and understanding of ultra intercepts would have reversed such Allied disasters as the American defeats at the Kasserine Pass, Anzio, the Battle of the Bulge, and the Allied defeat at Arnhem.[16]

Enigma was the focal point of the Allies' ultra operation. Essential elements of information, other intelligence requirements and many notable intelligence indicators passed into Allied hands because of the successful exploitation of deciphered Enigma data. This information which the Allies so skillfully acquired proved to be the weak link in the alleged German intelligence chain of invincibility. Reading the German's secret mail did not solely win World War II for the Allies—it could not be expected to do that—but it was an advantage which was certainly in their best interests to have and to use effectively.

CONCLUSION

For its time, in the twenties, thirties and forties, the Enigma cipher machine was the most advanced cryptologic marvel that the world had ever known. Nevertheless, Professor Jozef Garlinski in The Enigma War has observed " . . . that all its [Enigma's] intricacies, which taxed the brains of the experts at the time, could now be solved by a computer within minutes."[17]

For its time, however, Enigma was the most advanced enciphering device ever conceived by the human brain. The rapid technological and scientific progress that has been made in the world since World War II, progress which all of us take for granted and view as commonplace in the eighties, was a direct result of the Allied-Axis struggle for superiority over one another.

It is only because of Enigma and the ominous security challenge it posed to the Allies to solve its riddle, that the science of cryptology and the art of cryptanalysis have truly reached the heights of unparalled intellectual achievement and overwhelming complexity in today's modern age of the computer. The Third Reich met its demise in 1945, but the scientific ferment of ideas and concepts that its scientists and technologists created have lived on only to further evolve to fruition. Enigma was only a small part of this German scientific ferment of ideas, but a very significant small part.

In the brilliant, yet troubled age we live in today, the need for security in high-level communications and intelligence work certainly has not diminished. Rather, it has magnified itself several times over. Today many codes and ciphers that are created by the different governments of the world in an effort to mask their respective plans, intentions and military-scientific secrets are so complex in nature that only a high speed computer would ever have a chance of breaking them—if at all.

This computer-like portrait of achievement, complexity and finesse is the legacy that Enigma has left to modern day cryptology and cryptanalysis. Undoubtedly, solving Enigma's secret helped the Allies to win the war and contributed to advancements in cryptology and cryptanalysis; nevertheless, even at our current level of sophistication in the study of secret com-

V-2 Rocket

munications and encipherment processes, there truly exist more questions than we have answers for.

Footnotes

1. Jurgen Rohwer, *"Ultra and the Battle of the Atlantic," (The German View), **Cryptologic Spectrum,*** (Reprint)(Vol. 8, No. 1) Winter 1978, p.9.
2. Patrick Beesly, **Very Special Intelligence: The Story of the Admiralty's Operational Intelligence Centre 1939-1945** (New York: Doubleday & Company, Inc., 1978), p. 64.
3. Rohwer, p. 9.
4. Ibid.
5. Peter Way, **Codes and Ciphers** (United Kingdom: Crescent Books, 1977), p. 89.
6. Ibid. Information note: Enigma's rotors gave it possible basic encoding positions equal to 26^3 or 26^5 depending on the type of machine used. But note that all possible permutations did not end with the rotors and their respective sequences—they were only one major aspect of Enigma's sophisticated encipherment system. As the Germans added and changed rotors and rotor sequences in their various modifications of the original Enigma model, they did likewise to the number of figure rings and plug jacks as well as to the number and assortment of plugs that would be fitted into the plug jacks in a variety of combinations, in order to significantly increase the total theoretically possible number of code permutations. The Germans also changed the Umkehrwalze (i.e., in English: a reflector or a reversing, static drum, which caused the letters in an Enigma machine to go through all of the rotors again while enciphering a new message), in 1937, and replaced it was a new and even more complicated model called Umkehrwalze B. (See Jozef Garlinski, **The Enigma War** (New York: Charles Scribner's Sons, 1980), p. xii, pp. 32-33.) All of these variable factors constantly being modified and improved upon by the Germans over the pre-war and war years, managed to keep the cryptanalysts at Bletchley Park in a continual state of flux and turmoil as they struggled to solve Enigma's secret. One more thing: The (naval) Enigma M-3 (with eight rotors) introduced at the beginning of the war in German U-Boats, fully incorporated all of the aforementioned nuts and bolts of Enigma's encipherment process, i.e., when multiplying all of its permutation factors together one would end up with a theoretically possible total number of cipher combinations in the area of 160 trillion! (See Rohwer, p. 9.)
7. Regarding the German navy's different versions of Enigma M: See Garlinski, p. 32; Rohwer, p. 9; Beesly, pp. 66-67, between pp. 188-189 (picture of M-4 naval Enigma machine with four rotors which was put into service on 1 March 1943); and Ronald Lewin, **Ultra Goes to War** (New York: McGraw-Hill, 1978), pp. 26, 32, 217.
8. Harold C. Deutsch, *"Ultra and the Battle of the Atlantic," (The Historical Impact of Revealing the Ultra Secret), **Cryptologic Spectrum,*** (Reprint) (Vol. 8, No. 1) Winter 1978, pp. 17-18. Information note: In any discussion about Enigma and the Polish Bomb devised to tap its secrets, it would be superficial not to also mention two very important, directly related terms: Geheimschreiber and Colossus. Geheimschreiber (British code-word: Fish) was an on-line radio-teletype system employed by the Germans in late 1943 to pass high-level Enigma traffic, in the hope of achieving, writes, Ronald Lewin, " . . . additional speed and security for top priority signals by the extremely high rate of its transmissions," i.e., 62 words per minute. Geheimschreiber (also known as private secretary or secret writer) was a definite threat to the progress made by the cryptanalysts at Bletchely Park in their daily endeavors to break out and to understand the everchanging, always complicated Enigma settings. The use of a one-time pad by this German radio-teletype system appeared, at first, to be insoluble. The British answer to Fish was: Colossus—the first computer which worked out the Geheimschreiber settings, and thus allowed the exploitation of high-level Enigma traffic to continue at Bletchley Park. (This explcitation was still unknown to the Germans.) In a technological sense, Geheimschreiber and Colossus as respective evolutionary offspring of the German Enigma and the British Bomb at Bletchley Park, most assuredly outpaced and transcended the level of sophistication already attained by their forerunners in the closing years of World War II. With the introduction of Geheimschreiber and Colossus into the opposing crypto-intelligence systems during the latter stages of the war, the Computer Age as it is known today, was just around the corner. (See Lewin, pp. 130-133, and Garlinski, pp. 129, 146-150.)
9. Lewin, p. 136, aptly describes Bletchley Park's image and purpose: A honeycomb—this must be the final and dominating image of Bletchley Park: a honeycomb of cells some of which may appear to have functioned independently of the main structure. But distance and perspective allow the significant patterns to emerge. It is now clear that huts and sections, individuals and teams, the Wren [Wrens=WRNS: Women's Royal Naval Service] at her bombe, the cryptanalysts at their ciphers, the calculations of the mathematicians and the creative ingenuity of the technologists were all parts of a whole—of an organism which, like honeycomb, had evolved to secrete a single product: in Bletchley's case, intelligence about the enemy.
10. Garlinski, p. 192.
11. See Lewin, passim; and Deutsch, pp. 19-22.
12. See Beesly, passim (esp. pp. 63-75) and Garlinski, pp. 65-99 and pp. 135-139, passim.
13. See R.V. Jones, **The Wizard War: British Scientific Intelligence 1939-1945** (New York: Coward, McCann & Geoghegan, Inc., 1978), pp. 332-464, passim. Also, for a detailed account of German's V-series weapons consult: Jozef Garlinski, **Hitler's Last Weapons** (London: Friedmann, 1978).
14. See Garlinski, pp. 121-134, passim (esp. pp. 122-127); Lewin, pp. 29, 59, 67, 114, 134, 234, 238 354; and William Stevenson, **A Man Called Intrepid: The Secret War** (New York and London: Harcourt, Brace & Jovanovich, 1976, p. 146.
15. Deutsch, p. 22.
16. Lewin, pp. 272-274, 284-288, 290, 310, 346-351, 355, 357, passim.
17. Garlinski, p. 190.

2nd Lt. Bateman holds a BA degree in history from Wichita State University. He is a 1977 graduate of DLI (Russian Language), and as a former MI Sergeant and Tactical 98G Russian Linguist, he served three years with the Collection and Jamming Company, of the 101st MI Bn (CEWI), 1st Infantry Division. Bateman participated in Reforger 79 and Gallant Eagle 80 and 82. He received his commission in Military Intelligence from OCS in 1981. He is a 1981 graduate of MIOBC at Ft. Huachuca, Az and the 37A TAC/EW Crypto Course at Ft. Devens, Ma. Bateman is assigned to the Directorate of Training Developments, Electronic Warfare Division, Evaluation and Coordination Branch. He is presently working on an MPA degree in Public Administration from Golden Gate University and is currently enrolled in the Infantry Officer Basic Course by correspondence.

INTELLIGENCE IS FOR THE COMMANDER

IEW 82 SPR

INTELLIGENCE ELECTRONIC WARFARE SYSTEM PROGRAM REVIEW

IEWSPR 82

The Intelligence Electronic Warfare System Program Review is well underway and the recommendations to be presented in October at Fort Huachuca should be of particular interest to everyone in the military intelligence field.

"Intelligence is for the commander" is the theme for IEWSPR 82. To insure that we in the intelligence field understand what the commander needs in the area of intelligence and electronic warfare support, an Army-wide sampling of commanders at division, corps, and echelons above corps is being taken in the form of televised taped interviews. The tapes will be shown at the IEWSPR and copies will be available for interested organizations.

The IEWSPR is an on-going effort involving three general officer panels. The panels will focus on IEW support to the Airland Battle with each panel taking a different perspective.

Panel I will consider present IEW capabilities and make recommendations on how these capabilities can be immediately improved. Panel II will consider future actions through 1990 and will address the effectiveness of the Mission Area Analysis process for identifying and resolving problems affecting training, doctrine, organization, and equipment needs. Panel III will review the research, development, and acquisition process to determine actions that can be taken to rapidly field materiel and systems to tactical forces.

The panels are comprised of tactical commanders, intelligence and other staff officers from the general officer ranks of the Army. Their recommendations will be briefed to the Vice Chief of Staff of the Army and other invited guests in October at Fort Huachuca, Arizona.

Panel member selection was based on the background and experience of the general terms of the stated objective of each panel.

In keeping with the theme, "intelligence is for the commander," issues for panel consideration were solicited from every major command. From these the panels will select the issues that are most pressing. The response from the field has been excellent; issues touching on virtually every area of IEW were submitted. The type of issues that will be examined include:

- Communications necessary to support IEW operations
- Time required for fielding IEW equipment
- C^3 for joint combined operations and the national-tactical interface

These issues are complex and have tremendous impact on the ability of IEW to support the Airland Battle.

In order to study the issues and develop recommendations, the panels were given specific goals early in the IEWSPR process. This was accomplished through a series of meetings at which baseline briefings were presented to panel members by representatives of major Army commands, other service and national intelligence agencies. These briefings served as a departure point for the panels, who then planned their course of action in examining the issues. In October the panels will be brought together at Fort Huachuca for the final meeting and presentation of recommendations to the Vice Chief of Staff. With the Vice Chief of Staff's approval, appropriate Army agencies will be tasked to take action on SPR recommendations embodied in an action plan. Follow-on in-process reviews will be held to insure objectives are met.

USAICS point of contact for the IEWSPR is Col. John F. Phelps, AUTOVON 879-3162/3166.

Panel I

BG Drummond (Moderator)
Dep Dir, Army Materiel Sys Analysis Acty
Aberdeen Proving Ground, Md. 21005

BG(P) Flynn
Spec Asst to Dir, NSA, Ft. Meade, Md. 20755

MG Marine
DCG, XVIII Abn Corps & Ft. Bragg, N.C. 28307

BG Riley
CG, 7th Sig Comd & Ft. Ritchie, Md. 21719

BG(P) Saint
Dep Comdt, C&GSC, Ft. Leavenworth, Ks. 66027

BG Powell
ADC, 4th Inf Div (Mech), Ft. Carson, Co. 80913

Panel II

BG Weinstein (Moderator)
DCG for Support, INSCOM, Ft. Meade, Md. 20755

MG Jones
Dep Cdr, CACDA, Ft. Leavenworth, Ks. 66027

MG Vesser
DCG, III Corps & Ft. Hood, Tx. 76544

BG E. Parker
Dep Dir, Requirements/Army Aviation Officer, ODCSOPS, USA, Wash, D.C. 20310

BG Ivey
ADC 101 Abn, Ft. Campbell, Ky. 42223

Panel III

MG Paige (Moderator)
CG, Eradcom, Adelphi, Md. 20783

BG J. Parker
DCSI, USAREUR/Seventh Army, Heidelberg, Germany, APO N.Y. 09403

BG Mason
Dep Dir, Cbt Spt Sys, ODCSRDA, Wash, D.C. 20310

BG Morgan
DCG, R&D, USA CECOM, Ft. Monmouth, N.J. 07703

BG Teal
DCSI, USA FORSCOM, Ft. McPherson, Ga. 30330

Mr. Hovey
Dir, Sig Warfare Lab, Vint Hill Farms, Warrenton, Va. 22186

Dr. Oswald
Tech Adv to MG Paige

Members of the 101st MI Battalion (CEWI) set up a M577 command track.

Track crewmembers wait to move out.

101st m
radar re

Rest stop turns to learning experience

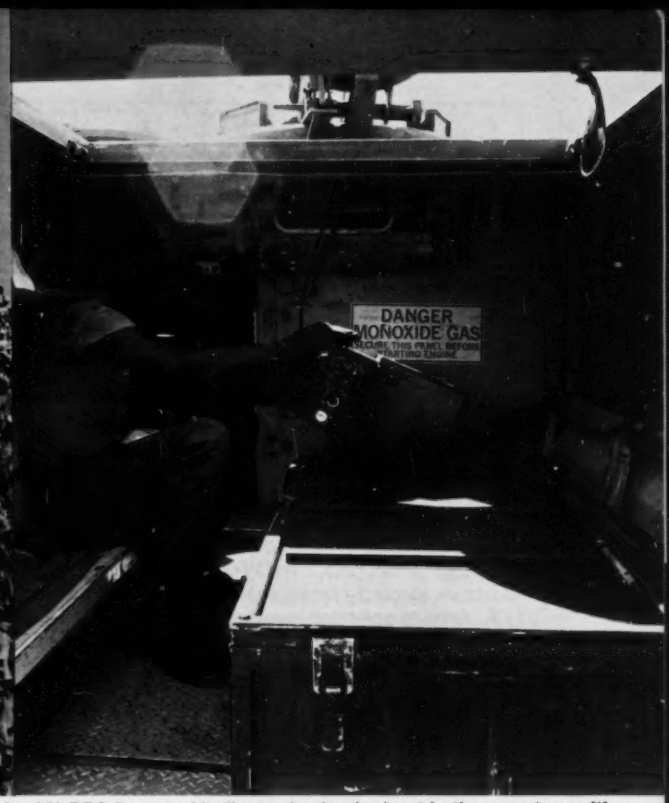
Photos by SFC Charles Arons, USAICS PAO

When the 101st MI Battalion (CEWI) stopped at Fort Huachuca for a few days of rest, their visit became a learning experience for USAICS students. The battalion from Fort Riley, Kan., was on its way to the National Training Center at Fort Irwin, Calif., to participate in the Gallant Eagle 82 exercise. School officials saw the scheduled visit of the unit from 9-12 April as an opportunity for intelligence students to get a first hand look at the equipment and conditions they will work with in the field.

Members of the 101st set up their tracks in a field adjacent to the main USAICS school complex. Students enjoyed seeing an actual CEWI battalion in a tactical situation, and, while not giving demonstrations, battalion members had access to nearby post facilities.

USAICS students tour the tactical setup.

101st members finish setting up an AN-PPS 5 ground surveillance radar receiver/transmitter antenna.



An AN-PPS 5 control indicator is checked out in the remote position inside an M113 armored personnel carrier.

USAICS students observe the AN-PPS 5 radar.

THE OV-1D PENETRATION MISSION

by Maj. Pat Gagan

Until tactical exploitation of remotely piloted vehicles or national space capabilities becomes a reality, or until other Special Electronic Mission Aircraft are developed, the OV-1D Mohawk aircraft remains the U.S. Army's only deployed aerial imagery intelligence collection asset. This aircraft, equipped with side-looking airborne radar, infrared, and photographic systems has the capability to monitor the modern battlefield by detecting and identifying enemy activity. The SLAR system is effective in a standoff mode beyond the range of enemy air defenses, effective employment of the IR and photographic systems requires penetration of enemy airspace beyond the forward line of own troops.

Although tactical surveillance officers have emphasized the standoff capability of SLAR to detect enemy main thrust efforts, they have neglected the penetration mission. Confronted with the unprecedented challenges of mid-intensity war, we cannot continue to overlook the use of this valuable adjunct to the ground commander's intelligence collection effort.

During the Vietnam conflict the U.S. Army's aviation did not operate in a high air defense threat environment. During the Cambodia Operation in 1970, Lamson 719 in 1971, and the North Vietnamese Spring Offensive in 1972, we began to encounter more sophisticated air defense weapons systems. A clearer picture of the mid-intensity battlefield was portrayed during the Arab-Israeli War in 1973. Vast quantities of Soviet anti-aircraft weapons were used and the environment in which U.S. Army aviation is expected to operate was graphically depicted.

The Soviet threat array provides a comprehensive variation of weapons that create an umbrella of air defense over their ground forces. This extensive arsenal consists of tactical fighter aircraft, and armed helicopters, surface to air missiles, and anti-aircraft artillery. The Soviets also capitalize on use of individual and crew-served weapons in an active air defense role. Following the principles of mass, mix, mobility and integration, all of these weapons are

OV-1D with SLAR pod, flasher pod, and drop tanks. They can all be removed for a penetration mission.

augmented by an elaborate electronic warfare effort designed to disrupt our use of the electromagnetic spectrum for aviation command, control and communications.

To win the first battle in this lethal environment, knowledge of enemy dispositions and intentions is vital. The U.S. Air Force's primary tactical reconnaissance aircraft, the RF-4C Phantom II, penetrates deeply across the FLOT. Its low-level flight profile of 200 to 300 feet above ground level makes a good target for the many Soviet air defense systems. The OV-1D Mohawk low-level flight profile, 10 to 15 feet above ground level, places it under the threat umbrella described and permits limited access to high priority targets beyond the FLOT. Despite resistance from tactical planners, U.S. Army aviation will play a key role near, and even across, the forward line of own troops as an active member of the combined arms team.

An aviation mission of this type cannot be made without cost consideration. Careful and precise planning must be exercised to insure the penetration mission is launched only if desired intelligence cannot be collected by any other means, including strategic overhead collection systems; and only if the target is critical to accomplishing the corps mission. It is envisioned that this high-priority, high-risk mission will be tasked personally by the corps commander, and the associated targets will be minimal. Possible targets might include special weapons storage areas or delivery means, vital communication links, or critical command and control nodes.

Once the decision is made for the OV-1D penetration of the FLOT to collect against these high priority targets, the question of aircraft survivability arises. Just as with the most sophisticated Air Force interceptor, Mohawk survivability in hostile airspace is a function of equipment, training, and tactics.

Equipment is available on the Mohawk to enhance survivability. Threat radar warning receivers allow aircrews to take evasive action when air defense radars acquire or engage airborne targets. An air defense missile jammer and countermeasures sets cause missile guidance interference. Additional infrared countermeasure equipment such as reflectant paint and engine suppressors serve to mask the exact location of the OV-1D from heat seeking missiles. Redundant mechanical components, like twin engines and dual control linkages, also reduce aircraft vulnerability and improve the chances of penetration mission success in a high threat environment.

Training for the penetration mission should be an integral part of the Aviation Combat Surveillance Qualification Course taught at the U.S. Army Intelligence Center and School. Threat awareness, integrated training, rehearsal and adherence to undeveloped standing operating procedures will collectively contribute to successful accomplishment of an inherently dangerous mission. Crew skill, confidence, and the will to win, all generated from training, will remain primary factors in determining the successful outcome of the penetration mission in combat.

It is apparent that meticulous planning involving effective use of all available intelligence and suppressive capabilities is essential for penetration mission success in a high threat environment. Consequently, the OV-1 aviators must expand upon basic flight planning factors. An example of such detailed flight planning follows:

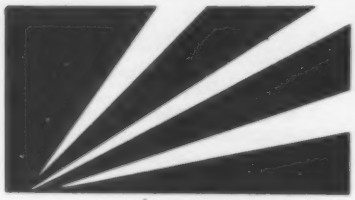
PENETRATION CHECKLIST:

1. Mission Briefing
   a. Friendly Situation
   b. Enemy Situation
   c. Enemy Air Defense Threat and Radars
   d. Weather
   e. Communications Electronics Operating Instructions
   f. Modes/Codes Identification, Friend or Foe
   g. Airspace Coordination
   h. FLOT Crossing
2. Assessment of Capabilities
   a. Radar Warning Receivers
   b. Infrared Countermeasures Sets
   c. Tactics Required
3. Preplanned Support
   a. Artillery
   b. Close Air Support
   c. Airborne Electronic Countermeasures (USAF)
4. Map Orientation
   a. Topography
   b. Minimum Risk Routes
   c. Obstructions
5. Pre-Flight Planning
   a. Map Selection
   b. Route Selection
   c. Select Air Control Points
   d. Select Check Points
   e. Plot Route
      (1) Magnetic Headings
      (2) Time/Mileage Tic Marks
   f. Select Go Low Point
   g. Select Go Silent Point
   h. Select Initial Points
   i. Select Terminate Points
   j. Select Barriers for Each Leg
   k. Note Search and Rescue Information
6. Actual Mission
   a. Max Avoidance of AD Systems
   b. Evasive Maneuevers
   c. Target Coverage
   d. Re-entry

Innovative tactics must be developed to enhance aircraft and crew survivability during a penetration mission. Detection avoidance at altitudes below the critical zones of the threat envelope and low-level evasive maneuvers should be practiced. Tactical integration of all available suppressive capabilities is another necessity. The corps operations officer has to be prepared to request selective destruction of acquisition, command and fire control radars to provide safe OV-1D penetration routes. This can be accomplished by preplanned artillery or sister service tactical air support. Similar integrated use of the warning and suppressive capabilities of airborne electronic countermeasures must also be planned.

With the proper mix of equipment, training and tactics, as well as the corps commander's support, the OV-1D Mohawk will continue to provide the tactical commander with another means to offset numerically superior

forces and their lethal anti-aircraft weapons. When carefully planned and selectively executed against a high priority target, the OV-1D penetration mission will not be a suicide mission, but rather a valuable adjunct to the tactical commander's intelligence collection.



Maj. Pat Gagan received his commission from East Tennessee State University in 1970. He graduated from Infantry Officer Basic Course; Military Intelligence Officer's Advanced Course; Command and General Staff College; Tactical Surveillance Officer's Course; Defense Sensor Interpretation Application Training Program and Advanced Synthetic Aperture Radar Interpretation. In addition to numerous infantry assignments, he has served as S2 of the 222nd Aviation Battalion, commanded an Aerial Surveillance Target Acquisition Platoon (OV-1) and served as a Tactical Surveillance Officer in INSCOM. Gagan is currently assigned as the Intelligence Officer of the Army's developmental Cavalry Brigade (Air Attack) at Fort Lewis, Wash.

Professional Reader

The Druid

by Leonard Mosley, Atheneum, New York, 240 pp., 1981

In this book, Mr. Mosley, a British journalist and author, presents a dramatic account of a purportedly unrevealed, World War II espionage operation. This is the case history of the one Nazi agent, who allegedly evaded the British Double-Cross System. The author has a long string of fiction and non-fiction works to his credit. These include biographies of Hermann Goering, Orde Wingate and Charles Lindbergh, among others, and a rather uncomplimentary study on the members of the Dulles family. Mr. Mosley has been a foreign correspondent since before World War II. He resides in Florida.

The author begins his work with a presentation covering the rivalry between the German intelligence and security services, the **Abwehr** and the **Sicherheitsdient.** In World War II, Mr. Mosley moves on to develop the case history of Gwyn Evans, the elusive Nazi spy. Evans was born in 1915 in a Welsh community in Patagonia, Argentia to a Welsh-Argentine father and a German mother. He attended an English school in Buenos Aires. In 1937, he moved to Bremerhaven with his mother and went to the University of Berlin. Evans was fluent in Welsh, English, German and Spanish.

Both the **Abwehr** and the **SD** were interested in developing agents among nationalistic elements on the Celtic fringe of Britain—the IRA and Scottish and Welsh Nationalists. According to the author, the **SD** recruited and trained Evans in the early stages of World War II. As the war went on, the **SD** became suspicious of **Abwehr** sources in Britain and decided to send in their own agent to develop networks and evaluate on-going operations. Their man for the job was Gwyn Evans, codename **The Druid.** A **Luftwaffe** bomber dropped him into South Wales during a bombing raid on Swansea in May 1941.

Evans began his operational activity after reaching London from Wales. He remained active in place allegedly from 1941 through the summer of 1944. He worked under cover as a musical program coordinator with the British Broadcasting Corporation. According to the author, Evans reported accurately on the preparations for the Dieppe raid and warned Berlin of deceptions employed by the Allies prior to D-Day.

Mr. Mosley develops the operational narrative in a detailed and coherent manner. The book is well written. One phase leads logically into another. The book reads at times like an espionage novel. The author conducted much research on the subject and interviewed or corresponded with numerous, unidentified personalities, who were involved in World War II intelligence operations. He concludes his work a summary outlining the present status of numerous **dramatis personae** involved in the operation.

For all its merits as a first class espionage tale **The Druid** has serious faults and flaws. The author is vague about sources and references. There are neither bibliography nor index. The author also interjects notional conversations between various characters involved in the operation into the book. He refers, as well, to MI-5 as "the internal wing of SIS." This statement should startle anyone familiar with the delineation of the British intelligence community into the Security Service (MI-5), in control of internal matters in the United Kingdom and the Secret Intelligence Service (MI-6), responsible for foreign operations. **The Druid** is lacking in depth when compared with many well-documented

(Continued on page 49)

USAICS Notes

Educators visit USAICS

The Administrative Support Facility at ICS was the site of the latest Cochise County Chapter of Phi Delta Kappa Fraternity meeting.

The professional educators met at USAICS to discuss what cooperation and assistance could be given to ICS to local educators. Included in the evening program was a tour of Alvarado Hall including the Learning Center and Language Lab, the classrooms, and the library.

The organizer for the program was Kenneth R. Leibner, an education specialist with the Directorate of Training and Doctrine, ICS, who is also the Chapter's vice president for membership.

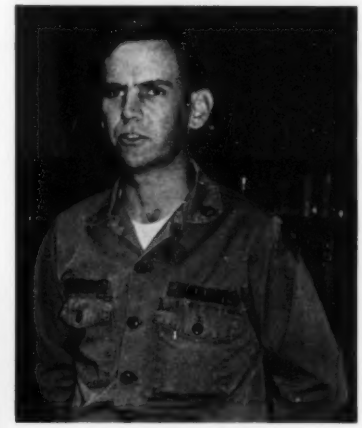
Approximately 20 members of the Chapter saw various media used to train students at ICS. Included were packaged language programs, Technical Extension Courses and video tape presentations. According to Liebner, "we (ICS) can assist the local education community by advising them of designs of educational programs." Local students can also be helped if they are having problems with Math, English, reading, and a host of languages from Arabic to Ukranian.

The fraternity members were impressed with the facilities and programs, and according to one, Dorothy McIver, a retired Sierra Vista science teacher, the program was "utterly fantastic."

Kenneth R. Leibner, chapter vice president for membership, explains a language course available at the ICS Language Lab to Patricia Hotchkiss, a librarian at Cochise College, and Paula Jones, an instructor at Cochise College, during their recent fraternity meeting held at Alvarado Hall. ***(Photo by SFC Arons)***

Instructors of the Month

The Instructor of the Month for February 1982 was Ssgt. David W. Iverson. Iverson teaches courses in tactical Identification, Advanced Ground Forces Order of Battle, and National Imagery Interpretibility Rating Scale for the Imagery Exploitation Division, Department of Surveillance Systems Maintenance. A native of California, Iverson has been with the active Army for over 10 years and was previously assigned to the 2d MI Bn, RAF, Alconbury, England, before coming to Fort Huachuca in September of 1980.



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The USAICS Instructor of the Month for April 1982 was Ssgt. Steven P. Alleman, a native of Pennsylvania, arrived at Fort Huachuca in September 1979 from a previous assignment with the 3d Battalion, 36th Infantry (Mech) of the 1st Brigade, 3d Armor Division, Kirchgons, Germany. He has been with the Army for eight years and is currently an instructor for courses in Photogrammetry, Plotting, Imagery Intelligence Countermeasures, Satellite Recogni-

tion Advanced Notification, and Operations Security. Alleman also received the Meritorious Service Medal in 1982 and the Airmedal while in Vietnam. He is currently working on an Associate of Arts Degree from New York Board of Regents.

USAISD Notes

USAISD takes new approach to high tech maintenance training

by CW2 Darrel L. Hopkins

Electronic Warfare and Intercept Equipment Maintenance is a rapidly changing field that is very difficult to keep abreast of, particularly as new advances in technology emerge everyday. USAISD recently incorporated a new concept in the training of 33S10 Electronic Warfare/Intercept Equipment Repairers by enhancing the basic digital logic training and adding microprocessor fundamentals and signature analysis. New equipment was also introduced in the course to support this new training concept. The equipment consists of Hewlett Packard Models 5004A, 5022A, 5035T, and 5036A all of which are available off the shelf and can be procured using OMA dollars.

The students are introduced to logic training using the HP 5035T logic lab. The logic lab enhances the digital logic training by allowing the student to build simple circuits and then advance to highly complex, multicomponent circuits used as gates, shift registers and clocks. During this phase the student is also introduced to the HP 5022A Logic Troubleshooting Kit which has the capability of stimulating a circuit and monitoring the response. These test results can then be used by the repairman to understand digital logic operations and to isolate the fault to the component level in the least amount of time.

After completion of the instruction and practical exercises on the logic lab, the student then proceeds to the HP 5036A Microprocessor Lab. This lab provides the student with both the hardware and software basics needed for understanding microprocessors and troubleshooting their circuits.

In this phase of instruction the student also learns to use the HP 5004A Signature Analyzer. The signature analyzer is a tool for field troubleshooting of complex logic circuits. It recognizes and displays unique digital signatures associated with data nodes in a circuit under test. By comparing these actual signatures to the correct ones, a service technician can back trace to a faulty node. The technique is especially useful in checking operation of microprocessor-based products and high speed data machines where data streams are long and complex and there are no conventional means to troubleshoot to the component level. The signature analyzer is capable of allowing the technician to troubleshoot virtually all digital logic to the component level—from the simplest of circuits through highly complex systems—provided the circuits or systems were designed for signature analysis or retrofitted after production. Those who have used the signature analyzer soon find that it provides as much aid in troubleshooting digital circuits as the oscilloscope did for analog circuits.

All future microprocessor-based systems should be built with signature analysis incorporated in the design to allow field replacement to the component level and reduce the heavy burden of board stockage and long line board exchange programs. These are always costly and sometimes ineffective and untimely. With the incorporation of signature analysis into the new systems, the mean time to repair and cost of support for these systems can be greatly reduced.

After learning the digital logic theory and troubleshooting techniques, the student is then trained on complex digital controlled equipment using the Honeywell 96B Recorder (AN/GSH-44) and on the concepts of Built In Test Equipment (BITE) using the Racal 6790 Receiver (R-2174/URR).

The new 33S10 graduate will be more easily trained on the new complex systems currently being planned, built and fielded in both the tactical and strategic electronic warfare and intercept equipment areas. This new approach to training at USAISD is allowing increased instruction on state-of-the-art equipment to be provided to each student at the least cost.

USAISD INSTRUCTOR OF YEAR CHOSEN

The United States Army Intelligence School, Devens honored its 1981 top instructors at the 16th annual Instructor of the Year ceremony. The event took place on April 8 at the Fort Devens Hodges Theater.

The three finalists competing for this year's award were Ssgt. Harold T. Huff, Jr., Clyde A. Abbott and Spec. 5 Joseph V. Greene.

Each month during the calendar year, a USAISD Instructor of the Month is chosen in competition against all classroom instructors. Monthly winners then compete for the Instructor of the Year Award.

Huff was selected as the 1981 USAISD Instructor of the Year. He is assigned to USAISD as an instructor in the Morse Data Preparation Branch of Morse Division, Communications Intelligence Department, Directorate of Training and Doctrine. In recognition of his achievement, he received the Army Commendation Medal and a Certificate of Merit with a $100 check from the Association of Old Crows.

Abbott, an instructor of a Basic Technical Course which he assisted in writing, was first runner-up. A civilian instructor at USAISD since 1971, he is assigned to the Maintenance Training Department, Directorate of Training and Doctrine.

Greene, an instructor in the Basic Theory Branch, Electronic Maintenance Division, Maintenance Training Department, Directorate of Training and Doctrine, was second runner-up. A USAISD instructor since October 1980, Greene is currently working on his Master's Degree at Fitchburg State College.

The keynote speaker for the ceremony was Col. Joseph F. Short, Commander of USAISD. He also presented the awards, which included Department of the Army Certificates of Achievement for Abbott and Greene.

The Instructor of the Year award was established to bring recognition to the School's outstanding instructors. Presentation of the award has been annual since 1960, with the exception of the period from 1964 to 1969.

These books are available for review. If anyone is interested please contact us.

South Africa: Time Running Out, (The Report of the Study Commission on U.S. Policy Toward Southern Africa.)

Modern France, by Barnett Singer

Follow Me, The Human Element in Leadership, by Maj. Gen. Aubrey "Red" Newman, USA (Ret)

Kennedy, Khrushchev, and Test Ban, by Glenn T. Seaborg

End of the Affair, The Collapse of the Anglo-French Alliance, 1939-40, by Eleanor M. Gates

The George Catlett Marshall, Volume 1, "The Soldierly Spirit," December 1880-June 1939

Puerto Rico's Fighting 65th U.S. Infantry from San Juan to Chorwan, by W.W. Harris, Brigadier General, U.S. Army (Ret)

Warplanes of the World 1918-1939, by Michael J.H. Taylor

B-52, Stratofortress by Jeff Ethell and Joe Christy

F-104, Starfighter, by J.C. Scutts

Maligned General, A Biography of Thomas S. Jesup, by Chester L. Kieffer

Secretaries of War and Secretaries of the Army, by William Gardner Bell

World War II Photo Intelligence, by Col. Roy M. Stanley II, USAF

(Continued from page 53)

Sakharov states early on in the book that he realized he was being groomed for a special position in Soviet life. "By the time I was nineteen, being groomed for a diplomatic career and wooed by the KGB myself, my father finally let me in on more details of his own involvement. One evening after a couple of drinks, my father, advising me on my career, confessed to me '...I could come home tomorrow wearing a KGB colonel's uniform, because that's my rank. You know that we have been better off than the rest.'"

The young Sakharov was able to enjoy imported American liquor and the latest men's fashions, and more importantly to the teenage Russian growing up—American jazz and rock. In many ways he was also very decadent towards the Soviet system of socialism, even though he was amongst the upper crust of the social strata of the Soviet Union.

High Treason is an insight into the social elite of the Soviet Union, much as was **MIG Pilot: The Final Escape of LT Belenko.** Sakharov's account of KGB and Moscow Center's manipulation of professional Soviet diplomats as well as those Soviet intelligence officers using the MFA as a cover, is of interest to both professional and arm-chair counterintelligence/security personnel.

Lt. Eric K. Naeseth
525th MI Group

ACSI Viewpoint

AN OACSI PERSPECTIVE— "TACTICAL INTELLIGENCE"

by LTC Robert J. Covalucci

Two critical factors have led directly to the increased importance of Army Tactical Intelligence:

First, during the immediate post World War II period the U.S. Army held a firm military advantage over its previous enemies and allies. However, since then we have witnessed a sustained and large set of programs that have made the armed forces of the Soviet Union much stronger and threatening. We also recognize that on tomorrow's battlefield we probably will not enjoy superiority in numbers of forces. Therefore, we will have to recognize that accurate and timely intelligence can and must compensate for much of the imbalance in size of opposing forces.

Second, the qualitative advancements in weapon systems, particularly their lethality and mobility, have placed a premium on advanced knowledge of enemy capabilities, deployments, and intentions.

The Airland Battle Doctrine places an enormous task on Army Tactical Intelligence. Previous Army tactical doctrine, "Mobile/Active Defense," while depending heavily on the intelligence soldier, did not place the same level of demand on intelligence as does the Airland Battle Doctrine. The unit intelligence officer has always been required to identify the enemy composition, disposition, and most probable course of action. Today, he must also determine the enemy routes of advance, movement tables, and relative target values as early as 96 hours before the enemy will engage friendly forces along the FLOT.

This mission can only be accomplished through the combination of well trained intelligence analysts with reliable intelligence, surveillance, and target acquisition (ISTA) systems. The Army is working hard to develop and procure ISTA systems that will allow us to see the battlefield at a depth of 300 km and beyond. While modernizing our ITSA systems, we must not allow our attention to be distracted from the decisive factor in any battle—the soldier.

Starting today, we must provide our intelligence soldiers with the best possible leadership, personnel management and training. If we are successful in these efforts, recruitment and retention will not be such great problems in the future. Assignment to the staff and faculty of the U.S. Army Intelligence Center and School should be looked upon as an "assignment plum" for intelligence officers and NCOs. It is their opportunity to share with hundreds the knowledge and experience they have gained in the field. People who are intimately aware of problems found in the field are best suited to modify unworkable intelligence doctrine and to improve the skill levels of our soldiers while they are in training which in turn eases the burden on our unit commanders.

The commanders of tactical intelligence units must recognize that they have been given a vote of confidence when they were chosen to lead our soldiers. Commanders must be forthright with their superior—lay out factually the capabilities and limitations of their units—and then strive to do more and better, in spite of shortages. Solutions to unit problems don't always come from above; solutions are frequently found by the soldiers and company grade officers in the units. We must learn to be imaginative and to take the initiative in solving local problems. But, while doing this, we must recognize and adhere to the concepts and doctrine for employment of our intelligence units as developed by TRADOC and approved by HQDA. Doctrine forms the umbrella for all our individual initiatives and serves to coordinate them in a compatible whole.

In some critical areas we have taken the initiative. Off-the-shelf procurement for training equipment is being pursued by HQ FORSCOM; expansion of the REDTRAIN program is more effectively serving our USAR units; the TROJAN Program which will more effectively train our tactical SIGINT soldiers is underway and is planned for expansion and there are numerous unsung unit level programs that have caused our division and corps commanders repeatedly to commend favorably on the quality of their intelligence soldiers and units.

From my perspective, it is evident that during the past twenty years, Military Intelligence Branch has made great improvements in the support provided to our tactical commanders. The Intelligence Organization and Stationing Study and the resultant Combat Electronic Warfare and Intelligence concept have led to military intelligence units that are recognized as productive and

essential members of the combat team. The G2/G3 relationship from division through DA level has grown closer and more interdependent. We in OACSI at DA, in a team effort with ODCSOPS, are committed not only to focus on the 1990 equipment and manning goals for our tactical intelligence units, but to indentify and implement short term improvements that will increase our intelligence capabilities for execution of the Airland Battle Doctrine.

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What is OPFOR?

by MSG Larry H. Hodge

Introduction

Misconceptions about OPFOR—what it is and what it is not—continue to become apparent as OPFOR products are circulated.

The most widespread belief is that OPFOR was created as an intelligence training vehicle, or that it is a giant recognition tool. It is further apparent that a great number of people believe the terms "OPFOR" and "Threat" are synonymous. What these beliefs have in common is that neither one has addressed the core of the OPFOR concept, nonetheless, both views are partially valid.

OPFOR. . . The name itself conjures up visions of a group of near-Russians, somehow assigned by a mythical higher headquarters to train U.S. soldiers in Soviet army standards. This group comes equipped with Soviet weapons and equipment and is fully prepared to enhance or degrade any unit's intelligence training program. AR 350-2 defines OPFOR as "an organized force created from U.S. Army units to portray a potential adversary armed force during training."

OPFOR is not a unit; rather, it is an idea whose time has arrived. If the OPFOR program is to be implemented in home station training, commanders, S2's, and S3's must become conversant in the program's goals and operating procedures. The basic idea governing OPFOR implementation is that units involved in field training exercises maneuver and train against a realistic opponent. Commanders and staffs involved in command post exercises must be opposed by realistic adversaries.

To accomplish the task requires planning and some amount of dedication. However, it absolutely requires no additional training funds. If a unit is going to the field, the entire unit is involved. Part of that unit can be trained to act like a Soviet or North Korean unit. Instead of maneuvering Blue on Blue, a potential adversary can be fielded.

People believe that an OPFOR unit must dress, look, and sound like its Soviet or North Korean model if it is to be effective. Not so! The idea is to portray the potential adversary's tactics and doctrine, not necessarily its appearance. Visual modification kits, foreign material for training, and OPFOR uniforms add realism, but they are not the focus of the OPFOR program. The primary emphasis on fielding OPFOR must be on insuring that its tactics are correct.

The draft copy of FM 34-75, OPFOR Training Module, Unit Training Manual has been fielded. This manual depicts how to train an OPFOR unit, from squad to regimental size, in realistic Soviet-style field tactics. No intelligence gaps have been allowed to interfere with FM 34-75's training objectives.

The manual provides a sound basis for establishing and evaluating an OPFOR unit or program. U.S. Army units need not be designated as permanent OPFOR units. To the contrary, it is much more valuable to rotate the duty. The OPFOR UTM is easily understood, with numerous illustrations, and can be employed to train an OPFOR unit rapidly.

The OPFOR is a training tool. It is a U.S. Army unit trained to act like its Soviet or Korean model. It is designed to provide realism to FTX's and CPX's. The OPFOR is not an intelligence trainer, nor is it a Threat force. It is not an add-on, expensive, nice-to-have, field companion. The OPFOR program has been developed to enhance combat training. Its goal is to familiarize U.S. Army commanders and soldiers with how potential adversary (Soviet or North Korean) tactics will be employed. The program provides a vehicle whereby the U.S. Army can train as it fights. It provides FTX/CPX realism essential to the Army's preparation for successful battle.

Background

The OPFOR program was created in 1976 with the objective of enhancing realistic combat training by providing a credible opponent for U.S. Army units. The OPFOR Branch at USAICS is responsible for developing the materials used as the basis for training OPFOR units and for developing OPFOR scenarios. We are currently writing FM 34-70, OPFOR Training Module—Soviet Military Forces Europe, and revis-

ing FM 34-71, OPFOR Training Module—North Korean Military Forces. A draft of FM 34-75, OPFOR Training Module—Unit Training Manual has been distributed.

At this time, the only military forces which are officially considered "potential adversaries," and the only ones approved for OPFOR portrayal are those belonging to the Soviet Union and North Korea.

It is important to understand that the OPFOR manuals are TRAINING MANUALS—NOT INTELLIGENCE STUDIES. The organization, doctrine, and OPFOR tactics—not those of any foreign military force. They are, however, based on the designated model—either the Soviet military, or the North Korean military. Every attempt is made to ensure that the information presented accurately reflects the organization, doctrine, and tactics of the model.

In some specific areas, little or no unclassified information is available on the model. In these cases, OPFOR is presented as being organized, and functioning, in manners consistent with what is known.

In other areas, hugh quantities of information—often conflicting—is available. In such cases, analysis is conducted to determine what information should be included in OPFOR materials. Criteria for making these determinations are:

1. Consistency with other reliable information.
2. Applicability to OPFOR portrayal.
3. Representatives of what U.S. Army units would most likely confront in combat operations against the model.
4. Consistency with the military logic of the model.

There are some strong arguments for employing OPFOR as the adversary in training exercises. First, it is official policy. Second, OPFOR is very similar to the military forces with which we are most concerned. Third, the tactics presented in OPFOR materials are those which will be confronted by maneuver battalions going to the National Training Center.

In the coming issues of **Military Intelligence**, the OPFOR Branch, USAICS, will present a series of articles describing OPFOR organization, doctrine, and tactics. Most of the information in these articles will be drawn from preliminary drafts being prepared for FM 34-70; therefore, the information presented will be consistent with that which will be included in the FM. These articles are being presented because FM 34-70 probably will not be in the field until FY 84, and the information is needed now if units are to develop effective home station OPFOR training programs.

It is not our intent to present thought-provoking, conjectural, problematic dissertations. We will simply describe how to do something, by providing specific information and guidance. Separate articles will be presented on organization, motorized rifle division tactics, motorized rifle regiment tactics, tank division tactics, tank regiment tactics, tactical aviation employment, artillery employment, air defense, reconnaissance, and special operations. Information presented will be consistent with the general information on tactical doctrine presented below.

OPFOR (SOVIET MODEL) TACTICAL DOCTRINE

In all types of combat, OPFOR doctrine emphasizes speed, mobility, mass, surprise, and security. Although considered to have the conventional firepower to overwhelm any adversary, OPFOR tactics are tailored to ensure that the OPFOR can operate successfully in either a conventional or nuclear environment.

All OPFOR tactics are based on a "combined arms" concept, and require effective coordination among various combat and support elements. This coordination is accomplished by extensive detailed preplanning, tight control by higher headquarters, and strict adherence to plans and orders. This approach results in some degree of rigidity. Doctrine dictated adherence to approved tactics also results in a certain amount of predictability; however, it creates a certain degree of independence from sophisticated, yet vulnerable, C^3 systems as well.

Although the OPFOR motorized rifle divisions are considered the most versatile and flexible element of the Ground Forces; the tank is considered the decisive weapon. Motorized rifle divisions and regiments have organic tank assets, and first echelon assault elements normally will include tanks unless the terrain precludes their use. Primary roles for tank units in offensive operations include exploitation of nuclear or chemical strikes, exploitation of gaps created by assault forces in Blue Force defenses, and pursuit.

OPFOR tactics reflect the concept that, on a modern battlefield characterized by a continuous high tempo of violent activity, aggressive offensive action is the only way to achieve victory. A key to accurate OPFOR portrayal is constant aggressiveness. In any engagement, OPFOR will attempt to maintain offensive momentum—even when suffering heavy casualties.

During offensive operations, OPFOR will attempt to avoid conducting frontal attacks against prepared defensive positions. Instead, attacks will be directed against flanks or gaps in defenses whenever possible. Preferable, from the OPFOR point of view, are attacks against forces which are attempting to deploy to defensive positions.

OPFOR will employ a frontal attack against a prepared defense if the tactical situation demands such action in order to achieve assigned objectives.

The attack against a defending enemy requires that a large force be concentrated in a small area. OPFOR will attempt to mass quickly, penetrate the Blue Force forward defenses, and press on rapidly to the depth of the Blue Force defensive zone. Obviously, success in this type of operation is dependent upon speed, shock power, and mobility, as well as mass.

When conducting this type of attack, OPFOR will be deployed in two echelons. The first echelon will consist of 1/2 to 2/3 of OPFOR maneuver elements. When required to attack over a relatively wide front, or when conducting as supporting or diversionary attack, OPFOR may be depicted as attacking in one echelon, with a somewhat larger than normal reserve, but no second echelon per se.

Following intense artillery preparation and strikes by tactical aircraft, the first echelon will attack on a narrow front, with the mission of penetration the Blue Force defenses, and creating and maintaining a gap. The second echelon will follow the first, passing through the breached defenses, and driving on to the Blue Force rear. Pockets of resistance which do not impede the advance of the second echelon will be bypassed. (They will be reduced by air strikes, artillery fires, and/or follow-on ground units.) If the first echelon meets little resistance, or is able to overrun the Blue Force defenses, it will continue to advance, followed by the second echelon.

The manner in which the OPFOR attacks is calculated to prevent the defender from redeploying effectively once contact is made. It is also intended to preclude an organized withdrawal. Should the defending force attempt to withdraw, pressure is intensified and envelopments are attempted. If the defender is able to initiate an organized withdrawal, the OPFOR will pursue immediately, and will attempt to destroy the withdrawing force, attacking the main body with artillery and air strikes, maneuvering ground units to attack flanks and cutting off withdrawal routes with airborne or airmobile forces.

OPFOR units will expect, and seek out, opportunities for meeting engagements. In meeting engagements, OPFOR will attack from the march, attempting to overwhelm the Blue Force before it can react effectively. If this fails, a small holding force will be used to "fix" the Blue Force while an enveloping or flanking movement is attempted.

However the meeting engagement develops, OPFOR actions will remain aggressive. Every attempt will be made to prevent the Blue Force commander from gaining the initiative.

As the meeting engagement is OPFOR's most prevalent type of combat, it receives the most training emphasis. Consequently, it is the type of combat in which OPFOR should be portrayed as being most proficient in FTX's and CPX's.

While OPFOR doctrine emphasizes offensive action, the development of defensive tactics has not been neglected. The major characteristics of OPFOR defensive operations are:

- Defense in depth.
- Emphasis on antitank defenses.
- Mobile counterattack forces.
- Extensive use of obstacles.
- Comprehensive air defense support.
- Massive, coordinated artillery support.

The OPFOR emphasis on defense in depth does not manifest itself in a series of static defensive lines; but rather in echelonment of strongpoints, with minefields, barriers, and ambushes located throughout the depth of defensive zones.

The primacy of tanks in OPFOR offensive operations is reflected in the anti-tank orientation of their defenses. OPFOR defenses are oriented around an integration of anti-armor guns and missiles, artillery, armor obstacles, and mobile anti-armor reserves.

Though OPFOR tanks are sometimes "dug in" in a deliberate defense, the primary role of tanks in the defense is counterattack. Tank units will normally be positioned near second echelon elements, and given the mission of counterattacking Blue Force units which have penetrated the forward defenses.

Accurate OPFOR portrayal must reflect the Soviet model's consideration of defensive operations as temporary in nature. OPFOR commanders will resume offensive action at the earliest opportunity. When launching an attack from a defensive posture, OPFOR units in contact normally will not conduct the main attack, unless the Blue Force has suffered severe attrition. Instead, the Forces in contact will provide supporting fires, and perhaps (scenario-dependent) supporting attack, while second echelon forces are brought forward to conduct the main attack.

When required to adopt a defensive posture, OPFOR units will defend tenaciously. As in offensive operations, a high casualty rate will be accepted among first echelon units if this ensures that the second echelon and counterattack force can destroy the attacking Blue Force.

A withdrawal by OPFOR is a defensive measure employed to gain time. It may occur as part of preparation for a counterattack or when shifting forces from one sector to another. Withdrawals will be conducted at night or during periods of limited visibility

whenever possible. Battlefield obscurants will be utilized if a withdrawal is attempted during daylight hours. Massed artillery fires will precede disengagement, and a feint may be utilized as a deception measure. Hasty minefields, ambushes, and chemical barriers will be employed along major withdrawal routes to delay any pursuit.

For the sake of training realism, a withdrawal should be executed or portrayed within the context of an overall situation where it is appropriate. OPFOR should not withdraw if another course of action is more in line with the doctrine of the Soviet model.

Deception efforts are an aspect of OPFOR operations which are too often ignored in FTX's and CPX's. OPFOR will utilize deception as a part of virtually all operations. The deception may involve the actual movement of maneuver units, artillery fires (to include nuclear fires, if appropriate for the scenario), aircraft strikes, and/or manipulative electronic deception. If OPFOR portrayal is to be credible, all OPFOR scenarios should include deception attempts.

The information above represents the doctrinal basis for OPFOR portrayal. Coming issues of **Military Intelligence** will include articles on how to portray—in the field, and on a map—specific types of operations being conducted by specific types of units.

OPFOR Branch, USAICS, solicits your input; not merely responses to our articles, but also your recomendations regarding subjects which should be covered, and the sequence in which we should address the various topics. Comments should be addressed to: Commander, U.S. Army Intelligence Center and School, ATTN: ATSI-TD-CTO (Bob Moorehead), Fort Huachuca, Arizona 85613. The Autovon number is 879-5825/3431, commercial (602) 538-5825/3431.

(Commander continued from page 2)

Also, we must:

Publish a quality Field Manual (FM 34-1, IEW Operations) to serve as a companion to FM 100-5 (Operations). (In July, we will host a meeting of knowledgeable personnel from the field who will serve as a forum to complete the manual);

Incorporate the results of the Mission Area Analysis into the Intelligence Electronic Warfare Systems Program Review to be held in October;

Expedite the development of the All-Source Analysis System (ASAS) and its fielding;

Identify alternatives to the now defunct Stand-Off Target Acquisition System (SOTAS);

Push the rapid fielding of ground IEW systems and the use of Unattended Aerial Vehicles (UAV).

QUESTION: How is USAICS involved with regard to the training being conducted at the High Technology Test Bed at the 9th Infantry Division, Fort Lewis, Washington?

ANSWER: USAICS is deeply involved in the on-going tests and evaluation taking place. We are closely aligned with the MI (CEWI) Battalion commander, his staff, and soldiers, as well as the G2 section of the division. As they apply new doctrinal approaches, principles and organizational ideas, we assist them in scenario preparation, evaluation, and testing. From this work, we shall create a series of required operational capabilities which will outline our future needs in the IEW world. Our relationship with the HTTB should pay dividends over the next several years.

QUESTION: Have you requested a MI (CEWI) battalion for USAICS? If so, in what capacity will it serve?

ANSWER: Yes, we have asked DA to give us a MI (CEWI) battalion. We envision it being used as the Artillery School uses its artillery units and the Infantry School uses it support troops. It will be a training aid. We will teach tactics in the classroom and apply them in the field. The students will fall out of the classroom and fall in on the battalion and deploy to the field for realistic training. IEW is complex and we cannot teach intelligence principles on viewgraphs. It must be done in a field enviornment. It will also be used to support the testing activities of the Intelligence and Security Board.

QUESTION: How does the USAICS fit into the total Army modernization effort?

ANSWER: The Army doctrine of the AirLand Battle requires the commander to see the enemy's second echelon. While we modernize our fighting systems, we must update our IEW systems, doctrine, training, and force structure in which those systems will be found. Innovations in tactical intelligence and EW are key items in the total Army modernization effort.

QUESTION: How will the Intelligence Community overcome equipment, personnel, and financial shortages?

ANSWER: The MI Branch and School are absolutely vital to the success of the United States Army. Key officials recognize that we are in an integral part of the total force and that we must have our fair share of assets. It is a matter of laying out a blueprint of where we are going and asking for the necessary resources in order to fulfill that plan. That is our challenge—change with the times—modernize.

AMERICAN BUSINESS USES *MI*, TOO

By Col. Stanley M. Ulanoff

The man in the grey fedora hat, pulled low over his eyes and with the collar of his trench coat drawn up around his neck, glanced furtively over his shoulder as he went through the door. He looked amazingly like Humphrey Bogart in the **Maltese Falcon**—but that was purely coincidence. He wasn't a foreign agent involved in international intrigue or espionage, he was merely a buyer for a department store "shopping" the competition. And, he wore the trench coat and hat to protect himself from the heavy rainstorm raging outside.

Although he wasn't the cloak and dagger type of espionage operative we read about in fiction (007, et al.), he was performing an intelligence function. He was on an intelligence mission to scout out the competition and find out what they were doing (prices, displays, quality, etc.) so that his own store could act accordingly.

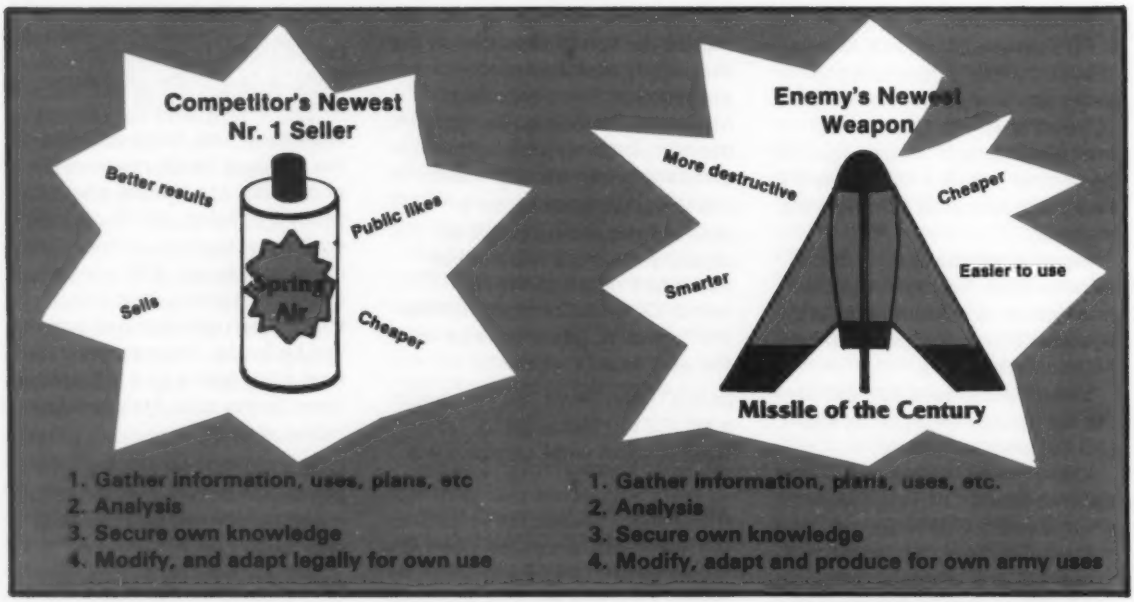
While the buyer's actions might appear to be covert, what he was doing is an accepted practice just as are the functions of a military attache assigned to a foreign country. It is as overt as studying the competition's ads in the mass media and buying his products in a store so they can be dissected and analyzed in your own laboratory.

One of the greatest acts of espionage of all times was not at all military or political. It was the one that brought the Industrial Revolution to America.

In 1769, Sir Richard Arkwright, the great English inventor, patented a spinning machine that led to England becoming the world textile center and a prime mover in the Industrial Revolution. To protect its predominant position, England passed rigid laws to safeguard the secrets of its textile machinery, processes, and systems from foreign countries. Security was maintained at all textile mills. No strangers were admitted and no employees were allowed to make drawings, sketches, or notes (the camera hadn't been invented yet).

Knowing that foreign merchants would pay well for the British textile secrets, 19-year old Samuel Slater, an employee at one of the textile plants, in 1790, committed to memory the entire intricate details of England's secret textile machinery. Subsequently, he emigrated to the United States where he reproduced the equipment and established mills in Rhode Island and elsewhere in New England, leading to American pre-eminence in the textile industry.

An earlier example of business espionage, again in textiles, brought the silk industry to Europe. Byzantine Emperor Justinian engaged two Persian monks, who had lived in China, to return there and to bring back silkworn eggs. They accomp-



lished this mission by hiding the eggs in hollow bamboo canes. As a result, Constantinople was able to begin silk production in about 550 A.D. All of the silk-producing catepillars in Europe, to this very day, are decended from those stolen eggs.

As MI professionals, know that the military commander who doesn't know what the enemy is doing is courting disaster. By the same token, the manufacturer or marketer who doesn't know what the competition is doing may very well be "in the same boat." (Incidentally, the "MI" in the title of this article refers to "Marketing Intelligence" although, as you will see, it is very similar to Military Intelligence.)

Increasing attention has recently been given to the dramatically growing use of competitive intelligence in the business domain. Competitive intelligence (a.k.a. business intelligence, competitive surveillance) is an aspect of the total market research function, that is, the gathering and analyzing of information about one's competitors' capabilities and intentions as an aid in the formulation of a marketing program. Gathering information about one's competition is not necessarily illegal or immoral. Nor does it have to be necessarily difficult or expensive.

According to Robert Hershey, in his article, **"Commercial Intelligence on a Shoe-string,"** in the September-October 1980 **Harvard Business Review,** it can be cheap, legal and simple to gather information about one's competition. Tracking rivals can be as easy as dissecting their products. Sales people can be trained to feed back to management, information about competitors, customers and suppliers. He also stresses the importance of saving every piece of information gleaned about competitors. An item that seems unimportant can become a valuable clue when tied to future information.

In a spectacular example of the use of competitive intelligence, General Motors has revolutionized American automobile manufacturing by retooling many of its plants in the United States and abroad, emulating the Japanese system of robotized manufacture, while employing the Japanese methods of boosting employee morale.

As part of its overall marketing strategy, GM has been engaged in one of the most frequently used methods of competitive intelligence, comparison testing. Both Japanese and American car companies run tests on each other's products to determine what improvements, if any, need to be made on their own products. This is used mostly to ascertain the competitor's attributes and performance. Close observation can disclose many things, such as quality of component parts used, performance characteristics and production methods.

Smaller companies also find the need for competitive intelligence methods on a continuous basis. Richard L. Pinkerton in a series of articles in **Industrial Marketing,** provides a step-by-step account of the organization of a marketing intelligence system, while describing the Ansul Company, a medium-sized industrial firm, undergoing the transition from a production orientation to a consumer orientation. To satisfy customer needs, a marketing intelligence system was employed, to provide a continuous flow of information from the marketplace, thus allowing for rapid adjustment and adaptation to environmental changes. According to Ansul marketing vice president William Rinelli, in Pinkerton's article, "In today's highly competitive business environment, marketing intelligence is even more important to a firm our size than it is to a large corporation. Ford Motor Company can survive an Edsel, the giant chemical companies can probably survive their over-expansion in fertilizer capacity, but mistakes like these would be fatal to smaller companies."

Many firms employ computers to process competitive data. However, we should bear in mind that the quality of computer results is directly dependent on the quality of the input data. Therefore, extensive data collection is imperative.

The consequences of using information gathered by competitive intelligence can be quite dangerous as the case of the Lehn and Fink Products Company shows. In a brilliant example of the use of competitive techniques, Lehn and Fink, makers of household cleaners, began production on a carpet deodorizer, just six months after Airwick Industries Incorporated introduced their new product type into the marketplace. Airwick paid for the research and development and took the risks of test marketing while Lehn and Fink carefully monitored their activities using many of the methods we have detailed above. A crash project was then initiated allowing Lehn and Fink to produce in six months what it took Airwick years to develop.

Copying the success of others is quite common in marketing. What Airwick found particularly upsetting here however, was that their product was to be prototype of a whole new product concept and for Lehn and Fink to have produced such a similar model was felt to be an infringement upon patent laws. This feeling of being wronged by Lehn and Fink was further strengthened by the remarks of Steven W. Lapham, the new products director at Lehn and Fink, who flaunted this successful imitation. This prompted Airwick Incorporated to institute court proceedings against Lehn and Fink, although the latter had employed overt, seemingly legal, intelligence methods. The fine line between legal and illegal methods in competitive marketing intelligence must be carefully examined before beginning any such program.

The success of a business, a product or a marketing program is highly dependent upon actions taken by competitors during that program's lifetime. For this reason, a comprehensive understanding and knowledge of competitive behavior in the past, present and future is a crucial

ingredient in the formulation of an effective marketing program, just as it is in military operations.

The amount of information required in order to maintain an efficient system of competitive intelligence is sometimes quite large. To free top management from the heavy burden of maintaining such a system, research consultants are often employed to collect or to analyze the data in order to facilitate the scrutiny of competitive activity for sound stragetic planning. It is advisable to maintain running files on each competitor so that materials can be brought forth when competitive appraisal is required.

The number of ethical sources from which competitive information can be obtained are many and varied. Much valuable information can be collected without recourse to covert methods. A great deal of it is readily available in the public domain. Competitors' annual reports are publicly released to, and kept on file by stockbrokers, libraries and newspaper publishers, such as **The New York Times.** Day-to-day information is readily available in publications such as **The Wall Street Journal, Barron's** and various **Standard and Poors** reports. Finally, trade journals contain a great deal of information about what marketing and production programs are being undertaken by competing companies.

One of the most frequently used sources of information about the behavior of one's competitors is a company's own customers and salespeople. Due to their own self-interest, customers often keep their suppliers informed about changes in the marketplace which may result in benefits to the consumer. Salesmen, who deal with the same customers visited by representatives of competing companies are able to convey to their employers these changes, such as those in sales policies, pricing and special deals or services. The salesman is also in a position to pass on to management the reactions of customers to various brands and services provided by competitors.

Competitors frequently make disclosures in their advertising that might help to uncover goals and strategies. Basic appeals and selling strategies can be discovered by an analysis of a competitor's ads, and then possible offset by counter claims in ads or sales presentations. Although new products are often hinted at in ads, advertisements can rarely be used for new product development, as they usually are not prepared until the product is almost ready for marketing.

The Freedom of Information Act has helped to uncover many corporate secrets. The act was originally intended to help individuals gain access to files containing personal information held by government agencies. As amended in 1975, the act has opened the door for businesses to gain useful information not previously available about competitors and actions of government agencies. This door has been opened even wider by the "sunshine laws," which allow for even greater access to government files. Unfortunately, these laws have made access to our secrets even easier for the Soviets and other potential enemies.

Examples of the use of government file information would be a pharmaceutical company using FDA materials to help determine current inspection policies or the use of agency reports, such as those available through OSHA which contain new processes, trade secrets and even old marketing plans of competitors. However, the entire Freedom of Information Act is currently being reviewed by the United States Government and there is a good possibility that government agencies will have greater control over what information is made public.

Another tactic for determining competitor's activities is comparison shopping as practiced by our "Humphrey Bogart-like" character. "Shoppers" are designated and sent to pose as bonafide customers at competitor's stores, thus providing valuable information regarding prices and merchandise carried. By this method, a retailer can remain competitive at all times.

Other legal sources of information are suppliers who accidently disclose practices of other firms in the industry that they sell to as well, and delegates to trade shows and conventions. Information can often be gleaned at such events by listening to the casual conversations of executives. Incidentally, many companies advise their delegates to remain sober at trade shows and conventions, in order to insure that company secrets are not inadvertantly revealed, and to be alert for information about the competition. In business, counter-intelligence is important too. It is essential that internal security be appraised to insure that competitors cannot gain access to company secrets. There are several precautions that should be taken to help prevent leaks, including:

a. Limiting access to critical information to a select few.
b. Enlisting employees' cooperation in not talking idly about any company activities with outsiders.
c. Using only outside firms who can be trusted not to divulge any information about one's company to others (e.g., printers of a price list).
d. Careful investigation of each potential employee to avoid the hiring of those who may be security risks.

A more extreme form of protection was advised in an article, **"How to Safeguard Trade Secrets,"** in **Management Review** of June 1970. It recommended that a contract to be signed by current and prospective employees should prevent discussion of those aspects of their jobs that the company considers proprietary. Also included should be a restrictive clause preventing an employee from holding a similar position with a competing firm within a period of time.

As an experiment, to find out how available competitive intelligence actually is, we created a fictional product. While trying to

determine who the prospective competitors are, where we are in relation to them and what their marketing programs and media strategies are, we found competitive information readily available from syndicated research services available at advertising agencies and even to some extent, in the library. Market share and demographic data can found in Simmons and MRI data books. Competitive advertising expenditures by media types are available in Leading National Advertisers. Also, Neilsen, SAMI, MRCA, and store audits are sources of competitive information which are readily available.

Just as in the military situation, a more difficult part of competitive intelligence is the ability to predict the competitor's behavior. One must continuously keep abreast of what the competition has done, is doing and plans to do in the future. At the same time, in order to formulate his own plans, the marketing manager needs some basis for predicting the reactions of competitors to them. To aid in the development of a productive and effective marketing program capabilities of the competitor must be evaluated and their strengths appraised.

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Professional Reader

Patton's Gap

by Richard Rohmer, New York: Beaufort Books, Inc., 240 pp., 1981

Some new historical questions on tactical decisions made in 1944 are posed in this easy-to-read book by Major General Richard Rohmer, Royal Canadian Air Force (Ret). At the time Rohmer was a young flight recce pilot with the RCAF's 430th Squadron, flying Mustang I fighter reconnaissance aircraft.

What makes the book interesting besides being just another stab at shedding new light on a topic which countless authors have written about, is that Rohmer clearly delineates the importance aerial photo intelligence played in being the "eyes" of the Allied ground commanders—Generals Eisenhower, Montgomery, Bradley, and Patton. Though at the time of the Normandy invasion the Allies enjoyed relative air superiority, air recce was not without its dangers of flak from enemy anti-aircraft gun positions and roaming Luftwaffe fighter patrols, eager to pounce on unsuspecting Allied pilots who weren't careful.

Probably the key point made in the book (which does suffer from some triviality of bar-hopping tales by Rohmer while on leave) is that when Montgomery was under pressure to get the Allied beachhead expanded out of the narrow strip of land along the French coast, he failed to allow Bradley's 12th Army Group (with Patton's Third Army in the forefront), to swing north from the right flank to close the gap at Falaise. Due to the tactical blunder on Montgomery's part, a great portion of the German Fifth Army was able to conduct an orderly retreat through the tightening Allied noose to live and fight again yet another day. Rohmer estimates that nearly a quarter of million German troops with their equipment were able to escape, thus ending the possibility of an early German defeat and negotiated armistice. How many Allied lives might have been saved due to a shortening of the war in Europe can only be a matter of historical conjecture almost forty years later.

Still, the importance of air reconnaissance is highly emphasized and how its proper utilization can effect a commander's battle plans, and therefore victory on the battlefield. Because of this **Patton's Gap** should be read by all personnel involved in intelligence collection and planning and by commanders who utilize aerial intelligence reports and products.

Lt. Eric K. Naeseth
525th MI Group

(USAIDS continued from page 19)

Top Left GAS—A simulated NBC casualty receives first aid during tactical road march.

Bottom Left MOVE OUT—Soldiers quickly move across a bridge during the tactical road march.

Top Right FIRE IN THE HOLE—Emplacing, testing and retrieving claymore mines was one of the military stakes stations.

Bottom Right SITE PREPARATION—Advance party personnel emplace camouflage nets while setting up the training site.

between 1830 and 0630 each night to include night walks, challenge and password, security and noise/light/litter discipline. The Tactical Platoon of Bravo Company acted as OPFOR and bivouaced approximately 600 meters from the remainder of the company.

PHASE V—Redeployment. Redeployment was basically a mirror image of the deployment phase. A morning and an afternoon tactical road march was used with integrated training incorporated in NBC, first aid and ambushes. Each of the road march groups began weapons turn-in immediately upon arrival at garrison, with the entire tactical site struck prior to the afternoon road march leaving the area.

PHASE VI—Maintenance/Cleanup/Turn-in. One day was spent cleaning and returning all organizational equipment, as well as cleaning of individual issue items. Platoon sergeants supervised these phases and inventoried all items. Each member of the company stood a full field layout inspection with emphasis on accountability, cleanliness and serviceability. All soldiers were released immediately following the inspection.

Much attention was focused on the first exercise. The AIT soldiers impressed all who observed their training with their high-level of enthusiasm and espirit. Student critiques of the exercise reflected great pride in accomplishment on each soldier's behalf and overall support for continuance of the exercise was expressed. Lt. Col. Worth A. Sweet, Jr., Commander, 1st Battalion and Capt. Carl E. Vikstrom, Bravo Company Commander were extremely pleased with the unit's performance. Sweet noted "...the exercise allowed the students to prove by performance that he or she has mastered soldierly skills common to all MOS's. The experience each soldier gained gave them confidence in individual skills and demonstrated teamwork—which is the key to victory in the profession of arms. I'm sure the other companies will continue to make these exercises most productive."

Coming to USAISD directly from commanding a tactical intelligence unit, Vikstrom feels the program "...will not only tactically orient students for CEWI, but will aid these soldiers for future skill qualification tests and Army Readiness Training Evaluation Programs once they graduate and report to their initial assignments. I would be pleased in any tactical assignment to receive soldiers trained this way at AIT."

The Tactical Training Program at Fort Devens is but another way USAISD responds to feedback from intelligence units in the field to provide technically proficient and tactically experienced soldiers.

1st Lt. Lee E. Taylor is currently the Executive Officer, Company B, 1st Battalion (AIT), USAISD. He holds an A.S. in history from Marion Military Institute and a B.A. in international relations from the University of Alabama where he was commissioned Armor in 1980. During his enlisted service, Taylor served as a Special Intelligence Analyst, Office of the Assistant Chief of Staff—Intelligence, HQ MACV J-2 in Vietnam. A graduate of the Tactical Intelligence Officer's Course, he has also served as a heavy mortar and cavalry platoon leader.

(Professional Reader-
Continued from page 34)

intelligence studies of World War II.

Mr. Mosley makes the startling claim that "Kim" Philby in coordination with his Soviet controller, Nicholas Rostov, codename **Ernst,** eventually recruited Evans for service with the Soviets, in the summer of 1944. The author apparently bases this claim on his correspondence with Philby in Moscow. Mr. Mosley loses track of Evans after 1944. He states that Evans subsequent activities may be known to the **KGB** or the West German services. It is possible that the author may be acting wittingly or unwittingly as a disinformation channel for Philby. Readers should view this work at best as mere conjecture or at worst with suspicion as an effort to denigrate British success against German operations in World War II.

John H. Carroll

Fundamental Principles of C³CM

by 1st Lt. Rebecca S. Bryan

The Soviet Union has incorporated radio electronic combat into their official military doctrine. The purpose of REC is to deprive the enemy of the capability to command and control his forces. On the modern battlefield, the U.S. Army must possess an offensive capability to combat the growing Soviet improvements in REC and that capability includes command, control and communications countermeasures (C³CM).

C³CM encompasses the integration of electronic warfare, deception, and operations security (along with means of physical destruction) to deny the enemy the use of C³ assets and to insure unrestricted use of friendly assets. If effective C³ is a "force multiplier" for the U.S. (who, according to FM 100-5, must fight outnumbered and win against a Soviet force superior in personnel and weapons), the effective C³CM will be a "force divider."

C³CM is a concept growing in popularity in military circles today. Often, the discussions are hardware oriented, with a good deal of emphasis on research and development, as well as required technical proficiency. However, it is imperative that C³CM become an integral part of U.S. tactical doctrine and training.

The need emphasis currently is on target development. The C³CM effort should be established to support the commander's overall plan for supporting fires. A targeting procedure, designed to support the concept of operations, involves a process that requires preparation and planning **prior** to the meeting engagement.

To effectively use deception, exploitation, jamming, and destruction against the redundant Soviet C³ system, vulnerability analyses must be conducted. In order to provide detailed information in a timely manner to the commander, a data base needs to be developed and maintained prior to the outbreak of hostilities. The analysis would be tailored to meet the unit's specific mission needs and situational requirements.

Additionally, priorities must be established to determine counter C³ activities. Assignment of general priorities would assist the real-time coordination of support between commands on the battlefield. Prioritizing the C³CM targets would streamline the assessment of intelligence data collected and the collection would be more sensitive to the needs of the commander as determined by the unit's mission. Of course, one of the priorities would be protection of friendly C³ systems.

The effectiveness of the C³CM effort is directly related to an understanding of the enemy's C³ system, area of operations, vulnerabilities, and assets. The requirement for economy of force and surprise necessitates the tasking of friendly C³CM assets based on the above understanding. A rapidly changing battlefield scenario could alter the planned counter C³ tasking. Therefore, a flexible tasking of specific targets acquired during the conduct of operations, based on timely intelligence, and the previously developed data base, will be necessary. Countering the Soviet and Warsaw Pact C³ (detailed knowledge of the enemy's C³ system, redundant friendly C³ counteractions, and integration of C³CM with other military actions) provide the basis for an effective counter C³ system. The C³ system must be orchestrated in defensive as well as offensive tactics.

To successfully implement C³CM, one must not overlook the importance of destruction and the integration of the counter C³ effort with other military actions. EW and C³CM are not synonymous. Physical attack (disruption and/or destruction) on enemy C³ assets will account for a large portion of the C³CM actions. There is no substitute for firepower.

As the Joint Chiefs of Staff indicated in their military posture statement for FY 83: "The Soviet emphasis on the integrated use of firepower, jamming and deception leaves no doubt that they are earnest in their belief that, by destroying an enemy's electronic emitters, they will eliminate him as an effective fighting force."

An effective C³CM effort, necessary to exploit enemy C³ vulnerabilities and destroy his C³ asset, will play a vital role in the destruction of enemy forces on the battlefield of tomorrow.

Cryptanalysis in history

Battle of Midway 4 June 1942

After the Japanese attacked Pearl Harbor, their conflicts throughout the Pacific met little resistance. The Phillipines, Corregidor, Malaya, Hong Kong, and Singapore all fell within months of the initial attack. The American ability to resist this aggression had largely been lost at Pearl Harbor, and many felt the expected follow-up attack on U.S. forces was coming soon. The question was not only when, but where the attack would begin. The Aleutian Chain, Midway Island, or a repeat on Hawaii were considered equal victims.

For some time, the U.S. Navy had been deeply active in trying to analyze Japanese Naval codes. As the relentless Japanese war machine continued on, the need for successes in the cryptanalysis efforts became more and more evident. In May, 1942, it became obvious that the Japanese were preparing for the major offensive following its Pearl Harbor victory. As these preparations continued, Naval cryptanalysts struggled with the tremendous volume of traffic available for analysis. According to records captured later, the Japanese were scheduled to change all naval ciphers on May 1, but failed to do so largely because of a false sense of security brought about by stellar successes that winter and spring. This belief turned out to be a crucial mistake as the Naval cryptanalysts had, by May, reconstructed 90 percent of all enemy naval traffic, and through some ingenious deceptions, had been able to recover most of the remaining 10 percent. Had the ciphers been changed, the setback to our efforts would have lasted several weeks.

Still using the penetrated codes, Admiral Yamomato sent operational plans detailing the attack on Midway, after diversionary feints on the Aleutians.

Not suspecting American resistance, the Japanese fleet prepared for the attack. Carrier based planes were armed for a land attack. When the American Naval force was finally spotted, it was too late. The Japanese fleet was severally crippled by sea and air bombardment while its aircraft were frantically being rearmed for a sea battle.

The Battle of Midway turned the tide of the Pacific war and marked the beginning of the eventual Japanese defeat. General George Marshall, U.S. Chief of Staff, said later that as a result of cryptanalysis, the U.S. had been able to concentrate its forces at Midway when otherwise they would have been 3000 miles out of place.

Battle of Tannenberg 25-30 August 1914

As war broke out in 1914, battle lines between Russia and Germany formed around the Masurean Lakes region in Poland. Russian strategy called for an invasion of East Prussia by two armies. One was to attack directly while the other circled the German forces and attacked from the rear. Russian forces were superior (at least in number) to those of Germany, but their communications support was in utter disarray. Russian communications were so inadequate that radio equipment could only be issued at Army Corps headquarters. Lower echelons were linked, if at all, with their Corps with a meager supply of field wire.

This situation reflected the general inefficiency of Russian mobilization. The distribution of new military ciphers and their keys, following the lead of overall communications support, was completely messed up. Within two weeks of the onset of the war on August 4, Russian signalmen had universally abondoned any attempt to encipher their messages. All traffic was routinely passed "in the clear." German radio operators, with little traffic of their own to send, had begun to listen to Russian transmissions as a diversion.

Germany had only one army to defend East Prussia from the Czar's forces. The rest of its armies were deployed against France in the West. The German strategy was one created almost from desperation. The Germans planned to attack the closest Russian force and then turn to attack the other. The question was which of these armies would it encounter first. Knowing this would allow the most favorable array of limited forces. A fearful Russian artillery barrage forced the Germans to retreat in such a way, however, that it found itself confronting both thrusts of the Russian attack at once.

The German radio operators had intercepted several Russian transmissions which described

rather fully the plans of the Russian XIII Corps, and later, of the plans of all remaining forces. With this information, the smaller forces had an advantage equal to having greatly superior forces. The Germans held a knowledge of enemy intentions unprecedented in military history. The resulting battle became a rout of monumental proportions. 100,000 Russians taken prisoner; 30,000 either dead or missing; the entire Russian 2d Army had ceased to exist. The victory catapulted the German commander, Paul Von Hindenberg, to supreme commander, and finally to the presidency of this country. For the Russians, Tannenberg marked the beginning of the decline which led to ruin and revolution. Tannenberg was the first battle won on the strength of what we now call SIGINT.

Herbert O. Yardley

Among the many Americans who worked so tirelessy in the early efforts of cyrptanalysis, H. O. Yardley is regarded as the leading pioneer. Born in Indiana in 1889, Yardley began his career in 1912 as a code clerk for the State Department. He soon learned of a natural gift for cryptanalysis by casually decipering a long message destined for President Wilson. The astonishing ease with which he was able to break what should have been the most difficult of American codes caused him to be chosen to head the newly created cryptographic section of the U.S. military Intelligence Division in 1917 after the U.S. ciphers were abruptly upgraded.

Following the war, Yardley convinced the Secretaries of State and War to jointly finance the establishment of an organization to plan and operate a ". . . Permanent organization for code and cipher investigation and attack." On 1 October 1919, the American Black Chamber was created under Yardley's direction. The Black Chamber's first task were the Japanese diplomatic codes, for even in the early 1920s, the growing Japanese military strength was noticed. Yardley's success with these ciphers was of great use to American representatives at the Disarmament Conferences following World War I. By 1924, the Black Chamber had solved over 45,000 enciphered transmissions involving the codes of over twenty nations and the Vatican.

In 1928, America elected Herbert Hoover its President, and he appointed Henry Stimson as his Secretary of State. Almost immediately Stimson withdrew all State Department funding from the Black Chamber, decrying such activity as ungentlemanly.

Yardley, then unemployed, wrote of his experience in the book, ***The American Black Chamber.*** This popular book caused quite a sensation and led to a number of restrictive laws concerning the craft of intercepting and analyzing foreign communications.

The remainder of Yardley's life was spent in a variety of pursuits including serving the governments of China and Canada in cryptanalytic duties. He died in 1958 and was buried with full military honors at Arlington Cemetery.

In the very specialized world of cryptanalysis, Herbert O. Yardley holds the position of a pioneer with unyielding vision and determination. In the larger sense of contribution to our country, his accomplishments are no less worthy.

Primary Technical Course (PTC), MOS 96D

The U.S. Army Intelligence Center and School offers a 2-week course which focuses on training critical tasks for skill level 2. To be eligible, soldiers awarded MOS 96D (Image Interpreter) must be an E-5 or on promotion list to grade E-5, or an E-4 and below performing in an E-5 position.

Soldier may attend either TDY enroute to a new duty assignment or temporary duty and return. However, the soldier's organization must fund the schooling in the case of TDY and return. TDY attendance at PTC and subsequent return to an oversea unit is authorized provided the soldier has a minimum of six months remaining to the command following course completion. Interested soldiers should submit DA Form 4187 (Personnel Action Request) through channels to: MILPERCEN, ATTN: DAPC-EPL-M, Alexandria, Va. 22331. Selection will be made on a first come—first serve basis.

The FY 82 schedule for PTC course number 242-96D20 is:

CLASS NUMBER	PERIOD
04-82	28 Feb—23 Mar 82
05-82	4 Apr—27 Apr 82
06-82	2 May—25 May 82
07-82	6 Jun—29 Jun 82
08-82	5 Jul—29 Jul 82
09-82	8 Aug—31 Aug 82
10-82	6 Sep—29 Sep 82

Point of contact at MILPERCEN is SSG Roby, Autovon 221-9363/4/5/, Commercial (202) 325-9363/4/5.

Professional Reader

National Defense by James Fallows, New York: Random House; 204 pp., 1981, $12.95

Former presidential speechwriter James Fallows has written a highly readable book which should be on every military officer's reading list. Though many will find fault with Fallow's narrative as well as his recommendations, his discussion of the skyrocketing price tags on equipment and the complexity of weapons systems and subsystems, warrant attention and thought by those responsible for military research and procurement projects. Additionally, for those in the intelligence community, Fallows addresses the problem of "threat inflation" which in turn is used as an agrument for ever-more complex, hard-to-maintain, and costly weapons to counter the "threat."

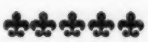
The Harvard University graduate distinctly states that effective combat leaders are needed over management-style leaders. He puts forth the argument that the armed forces are unique in that they are professions needing leaders whose subordinates will be willing to follow them into combat when their own lives are at stake. This is not to mean on Fallow's part that managers are not needed in the services, but rather the mistake has been made of trying to make all officers fit into the same mold of being a leader, a manager, and a theorist, all rolled into one, instead of developing officers in the area in which they are most gifted. He cites the problem of micro-management as tied to the importance of delegation of authority in military operations. "An army that delegates real responsibility to the leaders on the scene will have some incompetents and even some Lieutenant Calleys, but it will move farther, faster in combat that one that has taught its officers to do only what they are told," Fallows writes.

Fallows covers how the Department of Defense procured the M-16 and the F-16, and in his opinion, degraded the performance capabilities of both with modifications made through bureaucratic infighting. The author praises the Navy's Special Projects Bureau for the production of SLBMs in that it has adopted the principle of having the same cadre of officers managing the project year after year versus on a rotational system where a program manager knows that the final product which is accepted won't be his full responsibility whether the system performs like a Volvo or fails like an Edsel.

One of the longest chapters and probably the weakest, is the book's "Theologians" chapter which discusses various perspectives nuclear strategists are raising and the fallacies therein of some of the same arguments. Fallows covers here in a few pages what really deserves to be covered in book-length detail to adequately examine the issues.

All-in-all, Fallows has written a book worthy of rewiew, for it offers food for thought. Besides pointing fingers at what has gone wrong within the system as so many books do, it also offers recommendations for improvement which may make our national defense more effective, less complex, and more cost-effective, and more importantly—combat-ready.

Lt. Eric K. Naeseth
525th MI Group



High Treason
by Vladimir Sakharov (with Umberto Tosi) New York: Ballatine Books, 311 pp., 1981, $2.75 paperback

Ballatine Books has shown some interesting initiative in the publishing industry by coming out with a series of paperbacks dealing with true-life espionage/intelligence stories, some published for the first time, others reprints of hardcover editions. One of the series' nine books which warrants reading and is also quite enjoyable is Vladimir Sakharov's account of growing up amongst, and becoming part of the Soviet Union's social elite as a professional diplomat in the Ministery of Foreign Affairs (MFA).

Sakharov also was tapped to do double work for the KGB such as many Soviet diplomats are. Eventually he became a double agent and worked for the CIA. When his discovery as a double agent seemed to border on being only a matter of time, he defected to the West.

His account (aided by the literary polishing of Umberto Tosi) is one of a certain segment of Soviet society enjoying elitism in the form of capitalistic products obtained from Western democracies. Many of these habits are developed by members of the Soviet diplomatic community during assignments and travel outside the geographical borders of the mother country.

Sakharov tells of his childhood and teenage dreams of following in his father's footsteps in the MFA (his father also was a colonel in the KGB). Because of his family's position in the Soviet hierarchy, Sakharov was afforded many opportunities and "helping hands" that he probably would not have had otherwise.

(Feedback-Continued from page 3)

Captain Menard to have written his article without enough criticism of his sources of information and I strongly urge him, when writing about or referring to internal problems of an allied nation, not to distort real facts and situations.

W. Gontier

Lieutenant General
Chief of Staff Belgian Forces

* * *

'Ballad' blasted

Editor

The Ballad of the MI Soldier on page 55 of the January-March 1982 of Military Intelligence was disgusting. This type of humor in our professional publication perpetuates the "myth" that Military Intelligence personnel are rear echelon soldiers hiding behind the "Green Door."

The majority of Military Intelligence soldiers, Non-Commissioned Officers, Warrant Officers and Officers have opened the "Door" in the last decade and have gotten their hands and boots dirty in demanding tactical assignments.

What makes the Ballad even more repulsive is the positive comments by Brigadier General Wilmot in the beginning of this issue, in his challenge to solicit qualified intelligence personnel to USAICS. What hard charging soldier would want to come to the home of Military Intelligence, when its professional publication supports a negative image of its soldiers? No professional I've talked to got a "chuckle" out of the Ballad. What Military Intelligence needs is an Editor who is also an Intelligence Officer.

Kenneth P. Petersen

Major, MI

Department of Tactical Intelligence & Military Science
USAICS

Editor:

A comment of your "Ballad of the MI Soldier," page 55 of the January-March issue of MI magazine.

The MI magazine is not a college newspaper, it is the professional journal of a branch of the U.S. Army. It has as its creed "Promoting professionalism in Military Intelligence" and reflects what Military Intelligence is to the rest of the Army. Your decision to run the "ballad" is evidence that you do not recognize these facts.

The "ballad" supports the view that MI soldiers willingly shirk soldierly duties, that we require better treatment, give less, do not fight for our country, and think that those who do are ignorant buffoons.

As the editor, you should have realized that the piece would be patently offensive to a large portion of your readership and would do absolutely nothing to support professionalism within MI. In fact, it did exactly the opposite, it lessened the professional dignity of every man and woman wearing the MI insignia. For this we do not thank you.

Albert Chartian, Capt., MI
Deborah L. Garvey, 2LT., MI
Jerry O'Brien, MSG, USA
Ronald Love, Maj., MI
James Prambey, LTC (Ret.), MI
D. Griffin, CW-2

. . . and enjoyed

Editor:

I guess you guys do have a sense of humor!

MSG Godskesen

* * *

Pleasant surprise

Editor:

I stumbled across the October-December 1981 edition of Military Intelligence and must state it was a pleasant surprise. The articles were professional and well written. I was particularly impressed with the article by Major Richard Felling on Multi-discipline Hostile Intelligence Threat (page 12). It is obvious that the U.S. Army is much more advanced than its sister services in recognizing the need for a MDCI analyst and its relationship to operations security.

It would be interesting to meet with the analyst described by James C. Mellen (page 25) on his ode entitled "I am an All Source Analyst." The person represented by this ode undoubtedly is everything to everybody. His extensive experience and knowledge make the optimum MDCI analyst. Should such an individual exist, I and many others would like to meet him.

I find this magazine to be without peer, an outstanding compendium of the MI functions. Keep up the good work.

William M. Feidl

USAF Civilian

* * *

Korean name game

Editor:

I read the article in your October-December 1981 issue with great interest and found it to be a useful unclassified document on the north Korean threat. However, I have a critical comment on Thomas Marks' use of the term "Democratic People's Republic of Korea." Secondly, I feel strongly that it is inappropriate for those of us in the U.S. Intelligence Community to use the north Korean chosen title in any way whatsoever. If you will review north Korean press articles you will find that their definition of "Democratic People's Republic of Korea" includes the entire Korean Peninsula. They often speak of the "northern half of the DPRK" or the "southern half of the DPRK," meaning "north Korea" and the "Republic of

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GPO Form 3625
(3-79)

paration/training for this assignment? What advice would you offer a 35A about to be assigned as the OB officer?

Comments should be addressed to: Commandant, USAFAS, ATTN: ATSF-CF-T (Maj. Finger), Fort Sill, Oklahoma 73503.

George H. Finger

Major, FA

* * *

The MI Creed

Due to the number of comments received from our publication of "The Ballad of the MI Soldier," we felt it proper to present a more realistic illustration of the MI soldier. We encourage your future correspondence and professional input into our magazine.

The MI Soldier's Creed

I am Soldier first, but an
Intelligence Professional
second to none.

With pride in my heritage,
but focused on the future.

Performing the first task
of an Army;
To find, know and never
lose the enemy.

With a sense of urgency and
of tenacity,
Professional and physical
fitness,
And above all:
Integrity—for in truth
lies victory

Always at silent war while
ready for shooting war;
The silent warrior of the
Army team.

Professional Reader

Wilderness of Mirrors by David C. Martin, Harper & Row, 236 pp., $12.50

This book is purportedly a study of the secret war for supremacy between the Central Intelligence Agency and the Soviet intelligence and security services since World War II. Mr. David C. Martin of **Newsweek's** Washington Bureau bases his chronicle on the interplay between the careers of two, well-known Agency officers, James Jesus Angleton and the late William King Harvey, and their respective parts in the Cold War. The author opens his work with a chapter on the mysterious death of the Soviet defector, Walter Krivitsky, in a downtown hotel in Washington, D.C. in February, 1941. After reviewing Krivitsky's revelations about Soviet penetrations in the British diplomatic and intelligence services, Mr. Martin moves on in subsequent chapters to outline and examine the operational activities of Angleton and Harvey. There are critiques and evaluations of the Berlin Tunnel, Soviet penetrations of the Western intelligence and security services, Cuban operations, major defector cases, and internal politics and developments in the Agency. The author revives several counterintelligence operations, including the Soviet effort against the late John Watkins, the Canadian Ambassador in Moscow during the fifties. These cases have been previously revealed by the press only in fragments. Mr. Martin develops them in a detailed and coherent narrative. The book is well written and at times taut. One chapter leads logically and chronologically into another. This story of the Cold War secret struggle reads at times like a thriller.

For all its literary merits, **Wilderness of Mirrors** has its faults and errors. Mr. Martin states in regard to his sources: "In order of importance they were retired intelligence officers; documents released under the Freedom of Information Act; and the public record." With this remark and a few attributable references to statements by retired Agency personnel, the author covers his source accreditations. No one expects Mr. Martin to reveal his sources. Frequent references to a "CIA division head," "a senior officer" or "a member of the station " convey, however, an impression of vagueness. There are neither footnotes nor bibliography. **Wilderness of Mirrors** suffers, therefore, by comparison with such well documented studies as Andrew Boyle's **The Fourth Man** (New York: Dial Press/James Wade, 1979) and Thomas Powers **The Man Who Kept the Secrets** (New York: Alfred A. Knopf, 1979).

Much of this book is based on the reminiscences of retired, high-ranking Agency officers. It is obvious that Mr. Martin became entangled in the many and varied interpretations of difficult cases. One good example is the imbroglio concerning the bona fides of the KGB defectors. Anatoliy Golitsin and Yuriy Nosenko. The impression emerges from opinions elicited by the author and expressed in the book that some former Agency officers talked freely in efforts to support their viewpoints regarding special operations. As a result in his "Afterword," Mr. Martin makes the harsh judgement that "The CIA's war against the KGB is undeniably just, but the reality is absurd."

The author has contributed to the literature of the Cold War. Despite his efforts and literary talents, he falls short of making a notable contribution by neglecting valuable source attribution and relying too much on the personal views and prejudices of old Agency hands, who still have operational axes to grind. Mr. Martin is therefore caught up in his own wilderness of mirrors.

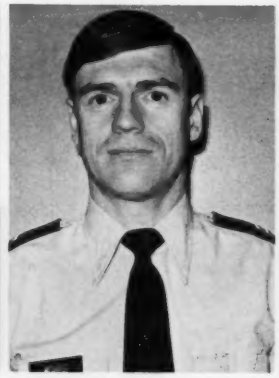
John H. Carroll

Officers Notes

Military Intelligence Branch Officer Career Development

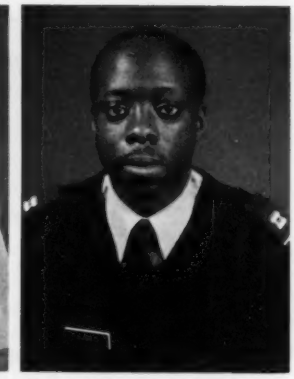
MI Company Grade

Lt. Col. James I. Dinniman
Chief, MI Branch



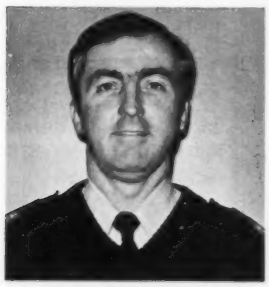
Capt.(P) Dan T. Morris
Professional
Development Officer

Maj. Carol Hemphill
Captains' Assignments



Capt. Duwayne Jones
Lieutenants' Assignments

MI Representatives (Field Grade/Warrant Officers)



Lt. Col. William J. Foley
Colonels' Assignments

Maj. Robert M. DiBona
Lieutenants Colonels'
Assignments

Maj. Charles D. Lurey
Majors' Assignments

Maj. Robert A. Harding
Majors' Professional
Development

CW3(P) Edward Mooney
Warrant Officers'
Assignments

Ms Eunice Johnson
Warrant Officers'
Assignments Assistant

Enlisted Notes

Military Intelligence Branch/Combat Support Career Division U.S. Army Military Personnel Center

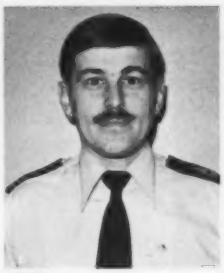
The personnel shown below are DA Branch personnel responsible for your career management. They can assist you in professional development and assignment matters.

Enlisted Professional Development

Mr. C.S. Evans
Chief, Assignment Section

Lt. Col.
John E. Riddle, Jr.
Branch Chief

MSgt.
Kenneth Beckett
Branch SGM



MSgt.
James M. Young
Senior PDNCO
CMF 96

SFC
Irwin N. Gotsch, Jr.
Career Advisor
MOS 96B/ 96C/ 96D

Ms Pamela Fields
Assignment Manager
MOS 96B/ 96C/ 96D

SFC(P)
Andrew A. Timan
Career Advisor
MOS 97B/ 97C

SP4 Cynthia Poles
Assignment Manager
MOS 97B/ 97C

Mrs. Sandra Wiemar
Applicant Manager
MOS 97B and Great Skills

Photo not avail.

Mrs. Esther Robinson
Chief Assignment Team
CMF 96

Mrs. Edna McGinnis
Assignment Manager
MOS 17K/ 17M/ 96H

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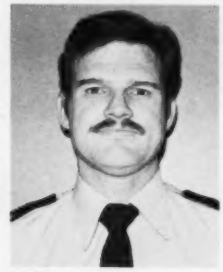

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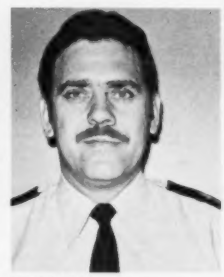

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weapons development since yorktown

by 2LT Eric Aubrey

You would think that steel would outlast muscle and blood, but in the Army it's not the flesh that's weak, it's the hardware. When today's young soldiers have become tomorrow's old soldiers, the equipment they trained with will most likely have died of obsolescence and faded away to a military museum.

The culprit is not poor quality control, but the stampeding advance of technology. Weapons systems sometimes become obsolete in the span of time it takes to get from the drawing board to the battlefield.

But 200 years ago, when the American colonies were about to win their independence from Great Britain, the situation was reversed, guns far outlasted the men who used them. A weapon then could be expected to survive any number of wars and would be used by several generations of soldiers.

Silent testimony to this phenomenon sits today on a battlefield in Yorktown, Va. A massive 13-inch bronze mortar—located on the site where the French and Americans defeated the British—was 100 years old when it entered the war for American independence. A century's worth of firings (misfirings) took its toll on the mortar; the trunnions, or supports, are bent at a 40-degree angle. But this didn't diminsh the weapon's effectiveness or its value to the troops. Gen. Washington was as grateful for a century-old mortar as today's field commander is for an M1 Abrams tank.

While there are many parallels between the Army of 1781 and today's forces in the area of weapons development, the contrasts between the two far exceed the similarities.

Technology is advancing so rapidly that our defense capability would quickly become second rate if the Army didn't continually search for improved weapons. The process is never-ending—as one weapon is being developed and fielded, work begins on an improved version.

The purpose for developing weapons also has changed. Two hundred years ago, the main reason for having a weapon was to protect the individual and his property. Today, the Army develops a new weapon to counter a weapon developed by a potential enemy.

This change in purpose has brought with it an increasingly complex process by which new weapons are developed. The cycle begins with identifying areas in which the Army's weapons may be weak. When the need for a new weapon is determined, specifications are written that spell out what the new weapon is to accomplish. As part of the development process, a limited number of the weapons are produced for testing and evaluation. If the weapon proves to be suited to the Army's needs, full-scale production begins.

The Army's goal is to have the weapon in the field for troop use within five years, but the actual process can take longer. A sophisticated weapon like the M1 Abrams tank can take from 6 to 12 years to reach the field.

The increased level of sophistication can, itself, create problem areas that delay the weapon's development. Add to that the challenge of simultaneously developing an array of other systems required to field the weapon such as training packages, test equipment, tools and subsystems.

Such a complex development procedure quite naturally requires a defense industry that is extensive, the ultimate in technical sophistication, and able to work to precise specifications.

During the 18th century, the federal government contracted with local gunsmiths to produce rifles and muskets for soldiers. An example of an actual contract with a Maryland gunsmith stated that the guns would cost no more than $10.66 each. The specifications were "good substantial proven muskets, 3-1/2 foot barrel with 3/4-inch bore, with good double bridle locks, black walnut or maple stocks, and plain strong brass mountings; bayonets with steel blades, 17 inches long; steel ramrods, double screws; priming wires and brushes fitted thereto, with a pair of brass molds for every 80 muskets to cast 12 bullets on one side, and on the other to cast shot of such size as the musket will chamber three of them."

The contract called for the gunsmith to produce 20 muskets a month. It took the gunsmith a day and a half to produce one functional musket. A factory producing small arms today can turn out hundreds of weapons each day.

Manufacture or importation of small arms conforming to a standard design suitable for military use didn't exist on any large scale in this country during

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the Revolutionary War. It wasn't because the use of small arms and the art of making them were not well developed in this country at the time. On the contrary, practically all men in the colonies were skilled in the use of firearms, and gun-making and repairing seem to have been done on a comparitively large scale throughout the country.

Standardized manufacture, involving the use of interchangeable parts, was unknown in those days. There were no factories anywhere in America that could produce standard arms in quantities sufficient to supply large bodies of troops.

Throughout the entire period of the Revolutionary War, the soldiers of the Continental Army were armed with different kinds of guns, some made in one state armory or another, some imported from France, others from the Dutch, Spanish, and French West Indies.

The experience of the country's early wars convinced the U.S. military of the need for a standard military arm and for adequate facilities to manufacture quantities sufficient to supply the troops.

Today, the Army is supplied with the most modern, sophisticated weapons available, and development of newer models is a continuous process. But despite the vast changes in weapons and their development since 1781, the spirit of victory at Yorktown continues. The desire and ability to defend our freedom is as strong today as it was 200 years ago.

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